D5.2: VALUE CHAIN ACTORS' NEEDS, PERCEPTIONS, CONSTRAINTS ANALYSIS

Funded by the European Union

ABSTRACT

aWISH project aims to develop and offer a cost-efficient solution to evaluate and improve the welfare of meat producing livestock at a large scale, across Europe. This approach will be developed and evaluated in close collaboration with all actors involved, from primary producers up to policy makers and citizens.

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ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

DOCUMENT SUMMARY

Full Title	**Animal welfare indicators at the slaughterhouse – aWISH**

Call	HORIZON-CL6-2021-FARM2FORK-01		
Topic	HORIZON-CL6-2021-FARM2FORK-01-05	Type of action	Research and Innovation Actions
Project coordinator	EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW- EN VISSERIJONDERZOEK (EV ILVO)		
Project URL	www.awish-project.eu		
Project start date	01.11.2022.	Duration:	48 months
Deliverable	D5.2 - Value chain actors' needs, perceptions, constraints analysis		
Document Type	R		
Dissemination Level	PU – Public		
Lead beneficiary	White Research SRL		
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Due date of delivery	31/10/2024	submission date	29/10/2024

DOCUMENT INFORMATION

HISTORY OF CHANGES

version	publication date	changes	author
1.0	11/09/2024	▪ initial version	▪ Anastasios Kyriakidis ▪ Nina Louvrou ▪ Christian Hauschildt ▪ Anastasios Tsakas
2.0	21/10/2024	▪ comments on draft/final version	▪ Anastasios Kyriakidis ▪ Nina Louvrou ▪ Christian Hauschildt

APPROVED BY:

version	publication date	organisation	person responsible
1.0	30/09/2024	▪ EV ILVO ▪ CONSULAI	▪ Noémie van Noten (EV ILVO) ▪ Margarida Próspero (CONSULAI)

ACKNOWLEDGENTS

we extend our sincere gratitude and acknowledgment to all aWISH Task 5.4 partners for their invaluable support and impeccable cooperation throughout the task. we also wish to thank the anonymous interviewees and survey participants who contributed to our research activities.

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Executive summary

The deliverable D5.2 was produced as part of Task 5.4, which falls under work Package 5 (WP5) of the aWISH project. WP5 focuses on assessing the socio-economic and environmental impact of various animal welfare (AW) improvement strategies. The main objective of Task 5.4 is to conduct a social analysis aimed at assessing the beliefs of actors across the entire farm-to-fork value chain. This analysis will identify which aspects of AW practices can trigger higher acceptance, leading to increased socio-economic impact and better marketability. The consolidated findings of this report will enable a more targeted implementation of the aWISH results by providing a better understanding of what needs to be monitored and reported to satisfy relevant stakeholders and consumers, while also considering any negative impacts that the use of technology could have on their acceptance of welfare-friendly products.

For this reason, **farm-to-fork stakeholder interviews** and an **EU-level consumer survey** were conducted to assess various dimensions influencing AW improvements, including stakeholders' needs, perceptions, constraints and willingness to pay. The stakeholder interviews involved a diverse group of participants, including sector regulators and policymakers, farmers, local catching teams/transport companies, food industry/retail representatives, veterinarians, welfare NGOs, and scientific experts. These interviews provided in-depth insights into the practical challenges and opportunities associated with AW improvements. Concurrently, the EU-level consumer survey targeted a broad demographic to assess consumers' awareness, attitudes, and behaviours related to AW.

Task 5.4 commenced with extensive desk research to identify key factors influencing the adoption of welfare-friendly practices. This research informed the design of interview and survey questionnaires. The second stage involved conducting **50 in-depth stakeholder interviews**, surpassing the target of 40, using a topic modelling approach to analyse the data and extract insights into challenges and opportunities in the value chain. These results shaped the subsequent consumer survey, which gathered responses from **5,064 EU consumers** to assess their attitudes and behaviours towards AW, using descriptive and cross-tabular statistical analyses. Finally, a comparative analysis of interview and survey data was conducted, integrating a Large Language Model within topic modelling and employing structural modelling to explore key barriers and motivators for adopting welfare-friendly

practices. The findings were used to inform policy recommendations and strategic initiatives, surpassing the respective target of 15 key barriers and motivators.

Important findings of **Deliverable D5.2** include:

- ✓ **Consumer Willingness to Pay**: A significant portion of consumers are willing to pay a premium for meat products that ensure higher animal welfare standards, indicating strong market potential for welfare-friendly products.
- ✓ **Key Barriers to Adoption**: Major barriers to adopting welfare-friendly practices identified include financial constraints, lack of awareness and education, and inconsistent regulatory standards across regions.
- ✓ **Motivators for Adoption**: The primary motivators for stakeholders to adopt welfare-friendly practices include enhanced public awareness, financial incentives, and robust certification schemes that build consumer trust.
- ✓ **Stakeholder Perceptions**: Stakeholders across the value chain, from farmers to policymakers, perceive animal welfare as crucial, but face practical challenges in implementation, such as operational costs and the need for systemic changes in farming practices.
- ✓ **Impact of Ethical and Social Factors**: Attitudinal factors, moral-ethical considerations, and social influences significantly shape consumer decisions, highlighting the importance of integrating ethical considerations into animal welfare strategies and communication efforts.

The concluding outcomes of this deliverable have important implications for the various actors across the farm-to-fork value chain. For *policymakers*, the insights into consumer willingness to pay and the identified barriers to adoption provide a basis for developing supportive regulations and financial incentives that can promote welfare-friendly practices. For *producers* and *farmers*, understanding the motivators and constraints can guide the implementation of more effective and accepted animal welfare strategies. *Retailers* and *marketers* can leverage the findings on consumer preferences and ethical considerations to enhance product offerings and communication strategies, thereby increasing marketability and consumer trust. Overall, these insights can help stakeholders align their practices with consumer expectations and regulatory requirements, fostering a more sustainable and welfare-oriented approach to animal production and marketing.

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GLOSSARY OF ACRONYMS

Acronym / Term	Description
AI	Artificial Intelligence
AR	Ascription of Responsibility
ATT	Attitude
AV	Altruistic Values
AW	Animal Welfare
BV	Biospheric Values
CSR	Corporate Social Responsibility
DOA	Description of Action
EV	Egoistic Values
F2F	Farm-to-Fork
GAC	General Awareness of Consequences
INT	Purchase Intention
KPI	Key Performance Indicator
LDA	Latent Dirichlet Allocation
LLM	Large Language Model
NEP	New Ecological Paradigm
PBC	Perceived Behavioural Control
PLS	Partial Least Squares
PN	Personal Norms
SEM	Structural Equation Modelling
SD	Standard Deviation
SN	Subjective Norm
TPB	Theory of Planned Behaviour
VBN	Value-Belief-Norm Theory
WTP	Willingness To Pay
WP	Work Package
WR	White Research

1. Introduction

Deliverable 5.2 was developed as part of Task 5.4 under Work Package 5 (WP5) of the aWISH project (Figure 1). Based on the Description of Action (DoA), the main objective of Task 5.4 is a social analysis of the needs, perceptions, constraints and willingness to pay for AW improvement (marketability) of value chain actors and consumers This task involved conducting in-depth interviews with stakeholders to investigate their needs, priorities, and current practices, with a particular focus on factors that facilitate or hinder the adoption of welfare-friendly approaches and the overall aWISH concept. Furthermore, a significant component of the task was an EU-wide consumer survey, aimed to validate the importance of factors assumed significant to drive consumer preferences and to understand public attitudes, awareness, and behaviours related to animal welfare.

Figure 1. Work Package 5 structure and its linkage with the other Work Packages of the aWISH project
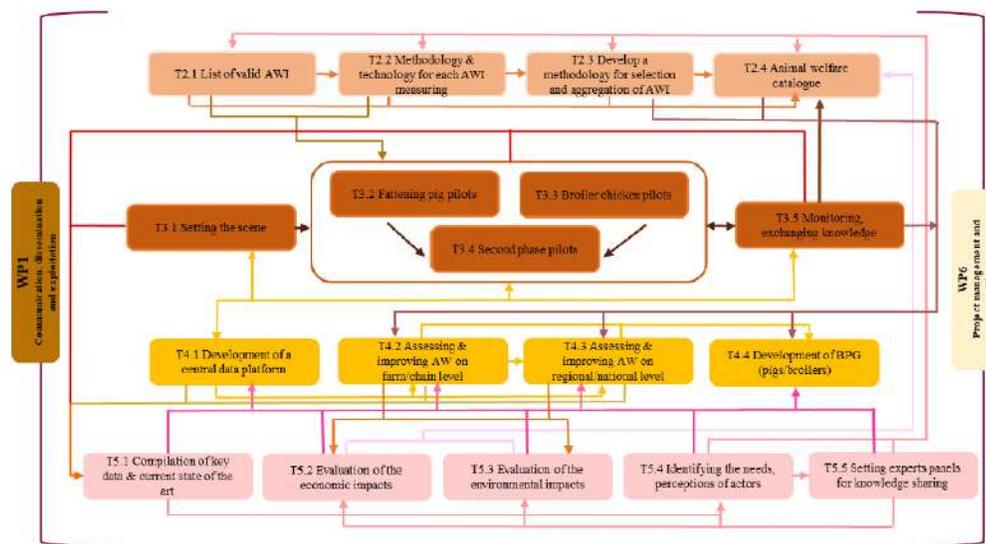
A total of **50 in-depth interviews** were conducted, exceeding the respective KPI (>40 interviews). The interviews included a broad range of stakeholders, ensuring a wide representation across the farm-to-fork value chain. stakeholders shared their views on various topics, including the specific requirements for implementing welfare-friendly practices, the perceived importance of these practices, and the challenges

they face in adoption. Key facilitating factors identified included consumer demand, corporate social responsibility initiatives, and supportive governmental regulations, while major hindrances encompassed economic constraints, lack of infrastructure, and inconsistent regulatory standards. Moreover, the study assessed stakeholders' resistance to change and their willingness to adopt new practices and pay more for animal welfare improvements.

The EU-level survey, on the other hand, achieved a robust sample size of **5,064 respondents**, surpassing the respective KPI (n=5000). This survey complemented our study and revealed that factors assumed to be important, such as clear labelling, ethical considerations, and perceived health benefits, significantly drive consumer preferences for welfare-friendly products. The survey also highlighted a substantial portion of consumers willing to pay a premium for meat products that ensure higher welfare standards, aligning with findings from stakeholder interviews.

Finally, based on the results of the EU-wide survey and the analysis of the interviews, an **advanced analysis** was carried out. This analysis focused on integrating perspectives from both stakeholders and consumers to derive comprehensive insights into the factors influencing the adoption of welfare-friendly practices. The analysis was structured into two main subsections: the findings from an advanced analysis of the stakeholder interviews and the results of the EU-level survey meta-analysis. The comparative analysis leveraged advanced analytical techniques including Large Language Models (LLMs) and Structural Equation Modelling (SEM) to derive meaningful insights from the collected data. This integration allowed for a robust examination of the underlying factors that drive or hinder the implementation of animal welfare improvements, providing valuable guidance for policymakers, producers, and other stakeholders in the meat production value chain. A total of **26 key barriers and motivators** were identified through this stakeholder analysis, surpassing the corresponding KPI (15 key barriers and motivators identified).

The rest of the document is divided into the following parts:

- **Part 2** includes the desk research that summarises findings from existing literature on animal welfare practices, consumer behaviour, and stakeholder needs.

- Part 3 details the methodology and results of interviews conducted with various stakeholders across the value chain, offering insights into practical challenges and opportunities.
- Part 4 discusses the design, methodology, and findings of an EU-wide survey assessing consumer attitudes towards animal welfare.
- Part 5 compares the outcomes of stakeholder interviews and the EU survey to identify common themes and differences.
- Part 6 presents the key findings from this study and their possible implications for policy and practice.

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2. Desk Research

In recent years, the concept of ethical consumerism has expanded beyond environmental sustainability to cover a range of ethical issues, including human rights and animal welfare (Auger & Devinney, 2007; Carrington, Neville & Whitwell, 2010; Prothero et al., 2011). As consumers become more aware of their purchasing power, they are increasingly seeking out products that align with their ethical values (Bray et al., 2010; Andorfer & Liebe, 2012). A key driver of this movement is the importance of personal values, moral norms, and internal ethics (Chatzidakis et al., 2007).

Among the ethical concerns that consumers face, animal welfare is particularly prominent, especially regarding meat production. There is growing public awareness around how animals are treated, leading many people to reduce their consumption of meat or avoid animal products altogether (Fox & Ward, 2008). Many consumers are willing to pay more for products that ensure better treatment of animals, even when this comes at a higher cost (Auger & Devinney, 2007). Zander and Hamm (2010) highlight that animal welfare is an important factor influencing consumers' willingness to spend more on ethically produced goods.

The increasing demand for animal welfare-friendly products has had a notable impact on the meat industry. As consumers become more conscious of animal treatment, they actively seek products that guarantee humane practices, from the rearing of animals to their eventual slaughter (Harper & Makatouni, 2002). This shift reflects the broader trend towards more ethical consumption.

Research shows that several factors influence consumers' decisions to buy animal welfare-friendly products. These include positive attitudes towards animal welfare, societal expectations, and a sense of control over purchasing decisions (Ajzen, 1991; Verbeke, 2005). Labels and certifications that guarantee ethical standards are crucial in building consumer trust and encouraging ethical purchases (Janssen & Hamm, 2012; Napolitano, Girolami & Braghieri, 2010).

Motivations behind ethical purchasing often stem from strong pro-social and environmental values. Consumers with these values are more likely to choose products that align with their beliefs, such as those certified for animal welfare (Thøgersen, 2011; Carrington, Neville & Whitwell, 2010). Specific demographic groups,

often described as "ethical consumers", are more inclined to buy these products compared to those who are indifferent or sceptical about ethical concerns (Honkanen, Verplanken & Olsen, 2006; Shaw, McMaster & Newholm, 2016).

The willingness to pay more for products that guarantee animal welfare further underscores the significance consumers place on ethical standards (Tait, Saunders, Guenther & Rutherford, 2016; Krystallis et al., 2009). Many believe that better welfare practices lead to safer, higher-quality products, which further encourages ethical consumption (Napolitano et al., 2010).

Certifications and labelling that denote compliance with animal welfare standards have become essential in guiding consumer decisions. Such labels help ensure transparency, providing consumers with the confidence that the products they purchase meet their ethical expectations (Vanhonacker et al., 2010). As societal movements towards healthier and more sustainable lifestyles continue to grow, the demand for ethically produced meat is expected to rise (Clark et al., 2016).

This trend highlights the need for meat producers and retailers to adopt transparent, verifiable practices that align with consumer expectations. The shift towards ethical consumption is not only a moral consideration but also a response to broader societal shifts towards sustainability and animal welfare (Cornish et al., 2016).

The desk research conducted for this deliverable gathered insights into the current state of animal welfare practices, stakeholder needs, priorities and factors influencing the adoption of welfare-friendly approaches in the meat industry. The findings from the literature review are summarised in the table below (Table 1).

Table 1. Desk research findings

Dimension	Findings
Needs	• Stakeholders need clear and enforceable standards for animal welfare • Consumers demand transparency regarding animal welfare practices • Farmers need practical guidelines for implementing welfare-friendly practices • Financial incentives are crucial for farmers to adopt welfare-friendly practices.
Priorities	• Ensuring animals can express natural behaviours is a priority • Improving the living conditions of animals is essential • Focusing on overall animal health and well-being is critical

Dimension	Findings
	• High-income countries prioritise advanced welfare standards • Low-income regions may prioritise basic welfare needs and reducing mortality rates
Current Practices	• Providing animals with more space is a common practice • Enriching the living environments of animals to enhance welfare • Better handling and transport practices are employed to reduce stress • Adoption of welfare-friendly farming systems with special labels indicating higher welfare standards • In low-income areas, animals often have more freedom but face higher risks from disease and mortality
Motivators	• Consumers' willingness to pay for higher welfare products facilitates adoption • Corporate social responsibility initiatives promote welfare-friendly practices • Governmental regulations are essential in promoting welfare standards • Development of welfare-friendly Labels helps in promoting higher standards. • Public Awareness campaigns play a significant role in promoting welfare-friendly practices.
Barriers	• Economic constraints are a significant barrier to adoption. • Inadequate infrastructure hinders the adoption of welfare-friendly practices • Lack of adequate training for farmers is a barrier • Differences in the definition of welfare across regions and cultures can hinder universal adoption • Cultural differences play a role in hindering the adoption of welfare-friendly practices.
References: Clark et al. (2017); Dawkins (2017); Dawkins et al. (2004); Fearing & Matheny (2007); Fraser (2008); Grethe (2007); Guy et al. (2012); Horgan & Gavinelli (2006); Hughes & Gentle (1995); Lay et al. (2011); SEI (2023)	

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3. Stakeholder Interviews

3.1. Introduction

This chapter presents the methodology and results of interviews conducted with stakeholders across the entire farm-to-fork value chain. The aim was to understand their needs, priorities, and current practices. For that reason, factors facilitating or hindering the adoption of welfare-friendly approaches, as well as the overall aWISH concept were explored. Additionally, resistance to change, willingness to adopt new practices, and willingness to pay more for animal welfare improvements were assessed.

3.2. Methodology

A semi-structured interviews approach was adopted (Burgess, 1984; Kallio et al., 2016). WR prepared the interview material, including interview guidelines, consent form, questionnaire and reporting template. The guidelines regarding the semi-structured interviews were circulated to the Task 5.4 partners (referred to as task partners hereinafter). The task partners were responsible for conducting the semi-structured interviews with the relevant stakeholders from the farm to fork value chain. **Fifty (50) interviews** were conducted in total, exceeding the KPI of *at least 40 interviews*[1]. The interviews were carried out from September 2023 through January 2024.

The interview material and procedures were approved by the Ethics committee of Utrecht University on 23 October 2023, to ensure that the interviews met the relevant requirements for such activities. Specifically, the statement of approval was as follows: *"This project has been reviewed by the Science-Geo Ethics Review Board for the professional and independent assessment of research proposals involving human participants (DGK S-23126)"*.

The task partners first approached their network to find stakeholders who might be interested in participating in an interview. The partners briefly discussed the aWISH project and its objectives with these stakeholders, either by phone, online (via email or video call) or in person. In case any of these stakeholders showed interest in participating in an interview, the task partners sent them the consent form by email,

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[1] aWISH GA 101060818, Part A, p. 12

which the interviewees had to read, sign and return by email before the interview. Then, the task partner and the interviewee arranged a meeting based on their availability either online or face-to-face to conduct the interview. The interview was performed in the local language or in English, depending on the preference of the interviewee, and had a duration of approximately 50 minutes. The exact interview questionnaire can be found in Annex – section 7.1. The task partners followed the interview questionnaire and kept written notes of the interviewees' answers. The written notes were anonymised, translated to English (if applicable), and transferred in an aggregated form to the reporting template and sent to WR for analysis.

An extensive desk research was conducted to design the interview questionnaire focused on investigating various aspects of animal welfare practices, based on previous studies in the field. The questions were formulated to gain insights into different stakeholders' perspectives, knowledge, and experiences. The interview questionnaire was structured into five distinct parts:

Table 2. Structure of the Interview questionnaire

Part	Description
Part 1	Background Information
Part 2	Factors Influencing Adoption of Welfare-Friendly Approaches
Part 3	Understanding and Perception of Animal Welfare
Part 4	Consumer Behaviour and Industry Awareness
Part 5	Final Thoughts

More specifically,

- **Part 1 – Background information:** In this section, various demographic and professional details about the interviewees were gathered, to ensure a diverse representation across the value chain. Specifically, questions were raised regarding their stakeholder group affiliation, gender, age, country of origin, and educational background.

- **Part 2 – Factors influencing adoption of welfare-friendly approaches:** This part explored the various factors that either facilitate or hinder the adoption of welfare-friendly practices. Stakeholders shared their views on economic, regulatory, and operational challenges and opportunities, providing a comprehensive overview of the influences on welfare practices.
- **Part 3 – Understanding and perception of animal welfare:** Stakeholders provided their insights into what constitutes good animal welfare, including their ethical considerations and understanding of welfare standards and practices. This part aimed to capture their perceptions and definitions of animal welfare.
- **Part 4 – Consumer behaviour and industry awareness:** This section focused on stakeholders' perspectives on consumer attitudes towards animal welfare, the impact of market demand on welfare practices, and the level of industry awareness regarding welfare issues. It aimed to understand how consumer behaviour and industry trends influence welfare practices.
- **Part 5 – Final Thoughts:** In the final part, stakeholders were invited to share their overall thoughts on the future of animal welfare in the meat production industry, along with their opinions on the aWISH project. This section provided an opportunity for participants to reflect on the broader implications and potential developments in animal welfare.

The study employed a Topic Modelling solution (Vayansky & Kumar, 2020) to analyse participants' responses from interviews, with the primary goal of organising the data into distinct topics. This approach was chosen to reveal latent themes and patterns that might not be immediately evident through qualitative analysis alone, offering a systematic, structured, and objective insight into the perspectives and issues raised by the interviewees.

The methodology focused on using Latent Dirichlet Allocation (LDA), a well-established algorithm in natural language processing (NLP) (Blei et al., 2003). LDA identifies topics within a set of documents by treating documents as a mixture of topics, where each topic is characterised by a distribution of words. The solution was developed in Python, utilising the Gensim library (Řehůřek & Sojka, 2011).

The process involved several key steps (Figure 2):

1. **Data collection**: Raw data was obtained from anonymised interview reports, consisting of 50 documents with responses to 11 questions and demographic information.
2. **Text Preprocessing**: Preprocessing steps were applied to prepare the text for modelling, including:
    a. Normalisation (converting text to lowercase)
    b. Tokenisation (splitting text into individual words)
    c. Cleaning (removing non-word characters and irrelevant elements)
    d. Stop word removal (using NLTK library)
    e. Lemmatisation (reducing words to their root forms)
3. **Model Training and optimisation**: An initial LDA model was trained with a predetermined number of topics (n=5). To optimise this number, the coherence score, which measures model interpretability, was calculated across various topic numbers (ranging from 2 to 20). The optimal number of topics, yielding the highest coherence score for each question, was selected. Final models were then retrained using the entire dataset with the optimal topic numbers. Visualisations, such as coherence score plots, were created to illustrate the optimisation process.
4. **Topics Extraction and Results Analysis**: The optimal LDA models were used to extract topics, each represented as a distribution of words. This allowed the identification of key themes and patterns in the interview responses, offering a structured and objective means of understanding the latent topics within the data.

Figure 2. Interviews analysis solution
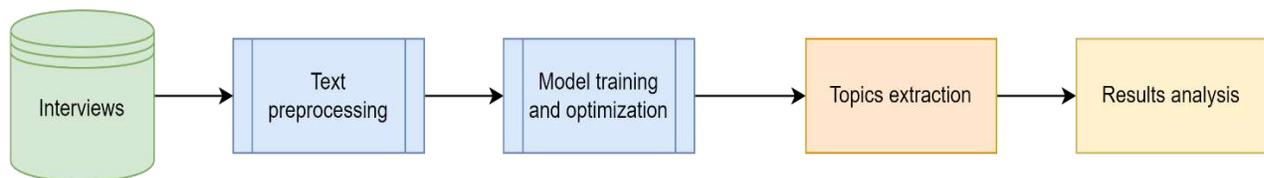
3.3. Results

3.3.1. Interviewees' background information

This section provides consolidated background information on the interviewees. The task partners made a deliberate effort to include representatives from the entire farm-to-fork value chain, ensuring the capture of a broad spectrum of insights into

stakeholders' needs, priorities, and current practices. Figure 3 illustrates the diverse representation of stakeholders from various segments of the farm-to-fork value chain who participated in the interviews.

Figure 3. Stakeholder type of interview participants

The **age distribution** of participants was predominantly skewed towards middle-aged groups, with the majority falling between 35-54 years. Specifically, 18 participants were aged 35-44, and 15 were aged 45-54, suggesting that most respondents were mid-career professionals with significant experience. Smaller groups were represented by 8 participants each in the 25-34 and 55-64 age ranges, while only 1 participant was over 65. The **gender distribution** leaned slightly towards female representation, with 28 female participants compared to 22 males.

The **education level of participants** indicated a highly educated group, with the majority holding advanced degrees. Specifically, 23 participants held a master's degree, and 19 participants possessed a doctoral degree. Additionally, 7 participants had a bachelor's degree, while only 1 participant held a high school diploma or equivalent. Finally, the diversity in the **participants' countries** of origin suggested that the findings reflected a broad range of cultural and regional perspectives within Europe (Figure 4).

Figure 4. Origin country of interview participants
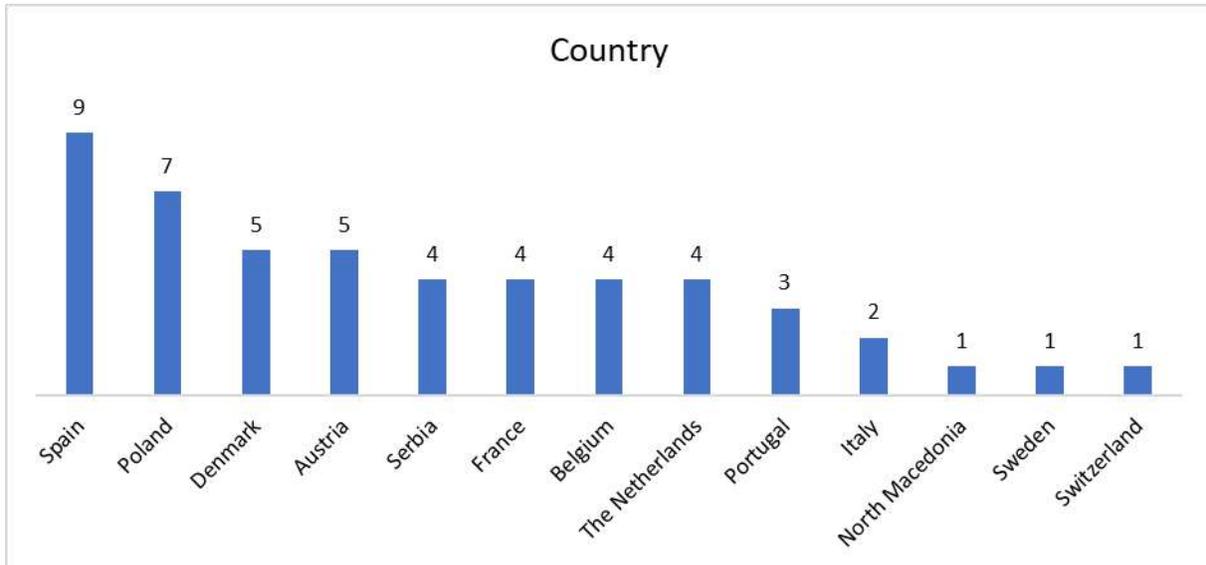
3.3.2. Interview analysis

This section summarises the findings from the interview responses, highlighting the factors influencing the adoption and implementation of welfare-friendly practices in animal production. Participants provided detailed insights into the motivators and barriers, revealing the complex interaction of educational, economic, ethical, and regulatory factors. Their perspectives offer a comprehensive understanding of current animal welfare practices, the challenges faced by stakeholders, and potential pathways for improving welfare standards. The synthesis of these responses reflects diverse opinions and experiences within the industry, emphasising key areas for action and a shared ambition for more humane and ethical animal production.

3.3.2.1. Factors facilitating or hindering the adoption of welfare-friendly approaches

According to the interviewees, the adoption of welfare-friendly approaches in animal production is influenced by a multitude of factors that can either facilitate or hinder progress (Table 3). **Awareness** and **education** on animal welfare play a critical role; a heightened understanding of animal welfare from either the farm to fork stakeholders or the general public can encourage the adoption of better practices, while a lack of it serves as an obstacle. **Ethical considerations** and a **sense of responsibility** towards

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animal welfare drive improvements, yet the **readiness of farmers** to embrace change and systemic shifts can vary, impacting the uptake of new practices.

Practical decision support tools for welfare assessment and the **economic viability** of implementing such practices are crucial, with **market demand** and **consumer preferences** often dictating the pace and extent of adoption. Economic constraints, such as **costs** and **consumer price sensitivity**, **operational challenges** in farms and slaughterhouses, and the dynamics within these settings pose significant barriers. **Regulatory frameworks** can both promote and impede the adoption of welfare practices, depending on enforcement and compliance. **Quality control**, the **ability to measure welfare outcomes** and the **influence of consumers** and **staff engagement** are decisive factors in shaping welfare practices. While **market forces** and **producer motivation** can vary, driving or deterring adoption, the principal **standards for animal health and welfare** act as fundamental drivers, with **knowledge enhancement** and **training** further supporting the adoption. Lastly, **public demand for better welfare** underscores the influence of societal values and economic factors in advancing animal welfare in production systems.

Table 3. Factors facilitating or hindering the adoption of welfare-friendly approaches

Factor	Influence on Animal Welfare Adoption
Awareness and Education	Essential for encouraging adoption of better practices; lack of awareness is a barrier.
Ethical considerations and Responsibility	Motivate improvements in animal welfare; individual and collective responsibility plays a key role.
Farmer Readiness and systemic shifts	Variability in readiness and systemic changes affect the uptake of new welfare practices.
Economic viability	Market demand and consumer preferences significantly influence the adoption; economic constraints present notable challenges.
operational challenges	Difficulties within farms and slaughterhouses, including costs and practicality, hinder adoption.
Regulatory Frameworks	can either support or obstruct welfare practice adoption, depending on enforcement and compliance levels.
Quality control and welfare Measurement	The ability to monitor and measure outcomes is crucial for effective welfare practices.

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Factor	Influence on Animal Welfare Adoption
Market Forces and Producer Motivation	These factors can drive or deter the adoption of welfare-friendly practices, varying by market and individual motivation.
Standards, Knowledge, and Training	Fundamental drivers for adoption; enhanced knowledge and training support better implementation of welfare practices.
Public Demand	Reflects societal values and economic considerations, playing a significant role in advancing animal welfare in production systems.

3.3.2.2. Obstacles and opportunities in adopting welfare-friendly approaches

Participants mentioned a variety of factors that may serve as either opportunities or obstacles for the adoption and implementation of welfare-friendly practices in the animal production sector (Table 4). **Certification schemes** provide a significant opportunity for market differentiation and value addition, encouraging producers to adopt higher welfare standards. **Actions by authorities and transporters** also present chances for welfare improvements. However, **societal misconceptions** and a **lack of understanding about animal welfare** can hinder the adoption of such practices, as can the **capacity limitations** and **logistical challenges in slaughterhouses**.

Financial aspects play a dual role; while the *high costs* associated with implementing welfare practices can be a barrier, there is potential for *financial returns* that can serve as a motivator. The **pricing of meat products** reflects a similar dual nature, where consumer willingness to pay more can offset the obstacle of lower-priced, less welfare-friendly options. **Legislation and regulatory frameworks**, despite their complexity, can drive the adoption of better practices, especially when they align with the need for clear standards and regulations across the supply chain.

Opportunities for advancing animal welfare are seen in the potential for **systemic changes** and **disease prevention strategies**, which can lead to long-term benefits and improvements. **Consumer awareness and responsibility** can catalyse shifts towards more welfare-friendly practices, counteracting broader global and market challenges. However, specific issues like **transport conditions** and **country-specific regulatory environments** can pose significant barriers. Nevertheless, the overall

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direction of the sector and the dynamics within the production chain, present substantial opportunities for enhancing animal welfare practices.

Table 4. obstacles and opportunities in adopting welfare-friendly approaches

Factor	opportunity	obstacle
certification schemes	offer market differentiation and value addition, encouraging higher welfare standards.	n/a
Actions by Authorities and Transporters	can enhance animal welfare through improved practices and regulations.	n/a
societal understanding and misconceptions	Enhanced awareness can promote welfare-friendly practices.	Misconceptions and lack of understanding can hinder adoption.
capacity and Logistical challenges	n/a	Limitations and logistical issues in slaughterhouses can impede welfare practice implementation.
Financial Aspects	Potential for financial returns can motivate the adoption of welfare practices.	High costs of implementation pose significant barriers.
Meat Pricing	consumer willingness to pay more can support higher welfare standards.	Lower-priced, less welfare-friendly options may dominate the market.
Legislation and Regulatory Frameworks	clear standards and regulations can drive adoption and ensure compliance.	complexity and lack of consistency can be challenging.
systemic changes and Disease Prevention	opportunities for long-term benefits and improvements in animal welfare through systemic and preventive measures.	n/a
consumer Awareness and Responsibility	can drive shifts towards more welfare-friendly practices, countering market challenges.	n/a
Transport conditions and	n/a	specific transport issues and country-specific

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Factor	Opportunity	Obstacle
Regulatory Environments		regulations can be significant obstacles.
Sector Direction and Production chain Dynamics	Present opportunities for enhancing welfare practices through the entire production chain.	Global market challenges can impact the adoption of welfare practices.

3.3.2.3. Perspectives on a Good Life for Farm Animals

Based on the experience of the participants, a good life for farm animals encompasses various factors that contribute to their physical, emotional, and behavioural well-being (Table 5). **Preventing illness** through optimal living conditions is a cornerstone of animal welfare, ensuring that animals are not just free from disease, but also have the necessary conditions to thrive. **Emotional well-being** is equally crucial, with a focus on creating positive experiences and addressing the emotional needs of animals to ensure their contentment and stress reduction. This extends to allowing animals the **freedom to express their natural behaviours**, which is essential for their psychological health. **Access to natural conditions,** including outdoor spaces, allows them to engage with natural conditions and exhibit behaviours inherent to their species. Meeting the essential needs of animals and **adhering to ethical considerations** form the basis of humane treatment, emphasising the importance of providing a nurturing and respectful environment.

Creating an enriched environment that aligns with animals' natural inclinations fosters a setting where they can engage in instinctual activities, contributing to their overall well-being. This includes providing ample space for movement and opportunities for **social interactions**, which are intrinsic to many species' natural living patterns. **Access to safe and readily available resources**, such as clean water and appropriate shelter, supports the physical health and comfort of farm animals. The **Five Freedoms** principle offers a comprehensive framework for animal welfare, ensuring freedom from negative states like fear, pain, and disease while promoting positive living conditions.

Table 5. Perspectives on a Good Life for Farm Animals

Aspect of well-being	Description

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Physical Health	Ensuring animals are free from illness and disease, with optimal living conditions that allow them to thrive.
Emotional well-being	Creating positive experiences and addressing emotional needs to reduce stress and promote contentment.
Behavioural Freedom	Allowing animals to express their natural behaviours, which is vital for their psychological health.
Access to Natural conditions	Providing outdoor spaces for animals, like sheep, to interact with natural conditions and engage in species-specific behaviours.
Ethical Treatment	Meeting essential needs and adhering to ethical considerations to provide a nurturing and respectful environment.
Enriched Environment	Aligning environments with animals' natural inclinations, allowing them to engage in instinctual activities.
Social Interactions	Offering opportunities for socialising, which is fundamental for the natural living patterns of many species.
Access to Resources	Ensuring availability of clean water, appropriate food, and shelter, supporting physical health and comfort.
Five Freedoms Framework	Promoting freedom from fear, pain, and disease, while encouraging positive living conditions for animal welfare.

3.3.2.4. Associations with Positive Animal welfare

Positive animal welfare (Table 6) is profoundly linked to the Five Freedoms concept, (Webster, 2001) which serves as a fundamental framework emphasising an environment devoid of negative experiences while promoting positive ones. The **ability of animals to display natural behaviours** and **live in environments that support these behaviours** is central to positive welfare, illustrating the fundamental link between an animal's surroundings and its mental and physical health. **Freedom from pain and discomfort** is a cornerstone of animal welfare, underscoring the necessity for animals to live in conditions that prevent suffering. Ensuring that **animals' basic needs for food, water, and safety are met** is essential for maintaining their welfare. The **state of animals in slaughterhouses** offers insight into their overall treatment and living conditions, making it a critical area for welfare assessment.

Innovations in welfare strategies, moving beyond traditional methods, are viewed as beneficial, introducing fresh perspectives and practices that enhance the well-being of animals. While **alternative diets and enrichments** (like varied foods or toys) are considered minor enhancements, they contribute to the overall well-being by offering

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mental stimulation and dietary variety. The **observation and measurement of animal behaviour** are critical in assessing welfare, as these behaviours reflect the animals' psychological state and well-being. Finally, research that focuses on **creating positive experiences** for animals is crucial in advancing welfare standards, highlighting the importance of understanding animals' needs and preferences.

Table 6. Associations with Positive Animal welfare

Concept	Description
Five Freedoms Framework	A comprehensive approach to animal welfare emphasising environments free from negative experiences and promoting positive ones.
Natural Behaviours	Ensuring animals can exhibit behaviours natural to their species, highlighting the link between their environment, behaviour, and overall welfare.
Freedom from Pain	A fundamental aspect of welfare, emphasising the need for animals to live in conditions that prevent pain and discomfort.
Basic Needs Fulfilment	Addressing essential needs like food, water, and safety, which are crucial for maintaining animal welfare.
Slaughterhouse conditions	An indicator of animals' overall treatment and living conditions, critical for welfare assessment.
Welfare Innovation	Adopting new strategies and practices beyond traditional methods to improve animal well-being.
Enrichments and Diet	Minor enhancements, such as varied foods or toys, contribute to mental stimulation and dietary variety, improving overall welfare.
Behaviour observation	Monitoring animal behaviour as a key indicator of psychological state and well-being, essential for welfare assessment.
Positive Experience Research	Investigating methods to create positive experiences for animals, emphasising the need to understand and cater to their preferences and needs.

3.3.2.5. Significance of Animal welfare

Based on the answers of the interviewees (Table 7), there is a clear **association** between good animal welfare practices and **improved production methods**, which in turn positively impact human health, underscoring the interconnectedness of animal welfare and human well-being. **Ethical considerations** are of paramount importance, with a strong emphasis on providing humane treatment and ensuring the ethical care

of animals, reflecting a moral responsibility towards them. The **spread of awareness and education** about animal welfare is gaining momentum, suggesting an increasing prioritisation of the issue in both professionals and the general public. **Staff training and awareness**, particularly in environments like slaughterhouses, highlight the importance of animal welfare at the operational level, indicating that those directly involved in animal handling also recognise its significance.

Policies and public stances on animal welfare are prominent, especially where ethical practices are advocated, signalling a broader societal shift towards valuing animal well-being. This concern extends to the overall happiness of animals, the impact of farming practices, and the quality of livestock life. **Performance metrics** and the experience of animals, particularly in production and slaughter settings, are closely tied to welfare considerations, linking operational effectiveness with ethical practices. Animal welfare's role as an indicator for assessing farming practices and guiding company policies underlines its significance as a benchmark for ethical and responsible production. **Product quality, consumer choices,** and **scientific research** all play roles in shaping the importance placed on animal welfare. **Sector pressures** for higher quality products and better production methods further emphasise welfare's significance. While there is a recognition that society may still accept lower welfare standards, there is a strong advocacy for higher ones, reflecting a desire for change and improvement.

Table 7. Significance of Animal Welfare

Aspect	Description
Production Methods	Good welfare practices are linked to improved production methods, benefiting human health and underscoring the connection between animal and human well-being.
Ethical considerations	A strong focus on humane treatment and ethical care, reflecting a moral responsibility toward animals.
Awareness and Education	Increasing prioritisation of animal welfare in public and professional spheres, indicating a shift in societal values.
Staff Training and operational Awareness	Emphasis on training and awareness in operational settings like slaughterhouses, showing recognition of welfare's importance at all levels.
Policies and Public stances	Advocacy for ethical practices and animal well-being reflects a broader societal movement towards prioritising animal welfare.

Aspect	Description
Performance Metrics	The experience and treatment of animals in production and slaughter are key indicators of welfare and are linked to ethical and operational effectiveness.
Product quality and consumer choices	The demand for higher quality products influences the emphasis on animal welfare, showing a correlation with consumer preferences and production methods.
Sector Pressures	Pressures for better production methods and quality products highlight the significance of welfare in the industry.
Legal Frameworks	Advocacy for stronger regulations and species-specific standards, showing a consensus on the need for legal support in enhancing animal welfare.

3.3.2.6. Proposals for enhancing Animal Living conditions from Farm to slaughterhouse

Respondents expressed a strong desire for **widespread changes across various stages of animal production**, from farming practices to transportation and slaughterhouse operations, emphasising a holistic approach to improving animal welfare (Table 8). There's a notable desire to address the **concentration of animal production**, advocating for a more decentralised approach that could alleviate some of the pressures and welfare issues associated with high-density farming. Respondents also emphasise the importance of providing animals with **better access to essential resources** like food and water, ensuring that their natural behaviours are accommodated.

Enhanced awareness and training for those involved in animal care are seen as fundamental, aiming to cultivate better stockmanship and a deeper understanding of animal needs from the outset. **Legal frameworks** are another area of focus, with calls for more robust regulations and an emphasis on **species-specific welfare standards**, including adherence to European guidelines and the adoption of better breeding practices, being voiced from the participants.

concerns are raised about the **conditions during the growth of farm animals**, suggesting a need for reforms in how these animals are raised and transported. **systemic improvements** are called for, particularly in the **way animals are housed** and **treated in slaughterhouses**, to ensure better welfare. For example, specific

changes in housing, such as the use of crates, particularly for sows, along with improvements in breeding and stunning methods are advocated to cater better to the needs of different species. Also, changes to **slaughterhouse processes**, including the **speed of slaughter operations**, are seen as a way to enhance welfare.

Table 8. Proposals for enhancing animal living conditions from farm to slaughterhouse

Area of Focus	Proposed changes
Farming Practices	Implement reforms to enhance the growth conditions of animals, with a focus on reducing high-density farming pressures.
Animal Transportation	Improve conditions during transportation to ensure animal welfare, emphasising the need for industry-wide training and education.
Slaughterhouse operations	Promote systemic improvements in animal housing and treatment, including changes to housing, breeding, and stunning methods.
Access to Resources	Ensure animals have better access to essential resources, like food and water, supporting their natural behaviours and well-being.
Training and Awareness	Enhance awareness and training for individuals involved in animal care, aiming to improve stockmanship and understanding of animal needs.
Legal and Regulatory Framework	Push for stronger regulations and adherence to species-specific welfare standards, including European guidelines and better breeding practices.
Process Improvements in slaughterhouses	Recommend changes to the speed of slaughter operations and the overall treatment processes to enhance animal welfare.

3.3.2.7. Knowledge on Animal-Friendly Production Practices

Respondents demonstrated a range of knowledge levels regarding animal-friendly production practices, influenced by various factors related to their professional roles and engagement with the industry (Table 9). Those involved in management, consumer awareness, and specific **industry roles** reported being well-informed, attributing their knowledge to job responsibilities that necessitate an understanding of animal welfare standards. **Training**, particularly in slaughterhouses, and **involvement with official practices and processes** were also mentioned as significant knowledge sources,

suggesting that direct experience and formal education play critical roles in informing individuals about animal-friendly practices. **Awareness of regulations and legal frameworks** was prevalent among the participants, although there was an acknowledgment that the interpretation and full comprehension of these regulations can vary, suggesting a depth of knowledge that goes beyond superficial awareness.

Labelling and consumer information presented a mixed picture; while some respondents were familiar with these aspects, there remained a degree of confusion or lack of detail in their understanding, indicating a gap between information availability and its comprehension. A **continuous learning** attitude was evident from the responses, with some individuals emphasising the importance of staying updated with new developments and scientific research to enhance their understanding of animal-friendly practices.

The role of **scientific focus and industry participation** was highlighted as a contributor to being well-informed, especially when it involves direct engagement with current trends and advancements in animal welfare. However, knowledge levels appear to vary with **context**; for example, while some were aware of country-specific practices and advancements, others pointed out discrepancies between what consumers are told and actual practices, hinting at the complexities within the industry.

Table 9. Knowledge on animal-friendly production practices

Knowledge Influencers	Impact on Awareness
Professional Roles	Individuals in management or specific industry roles have heightened awareness due to their job responsibilities related to animal welfare.
Training and Education	Formal training, especially in slaughterhouses, and engagement with official practices enhance knowledge of animal-friendly practices.
Legal Frameworks	A prevalent awareness of regulations exists, though understanding varies, indicating a range of depth in regulatory knowledge.
Labelling and consumer information	Mixed levels of familiarity with labelling and consumer info suggest gaps between information availability and comprehension.

continuous Learning	An attitude of ongoing education, keeping abreast of new research and developments, is crucial for understanding animal welfare practices.
scientific and industry Engagement	Direct involvement with industry trends and scientific research contributes to a well-informed perspective on animal welfare.
contextual variability	Knowledge varies with context, such as differences in country-specific practices or discrepancies between consumer perceptions and reality.

3.3.2.8. Perspectives on Animal welfare Monitoring

Monitoring animal welfare gathers strong support across various stakeholders, who view it as *a critical component of maintaining and enhancing animal well-being in farming environments* (Table 10). There's a consensus that **effective monitoring is fundamental** for identifying and addressing welfare concerns, ensuring that farming practices evolve in a manner that prioritises the health and comfort of animals. The integration of monitoring with established welfare standards is deemed necessary, serving as a key mechanism for compliance and continuous improvement in animal care.

calls for **harmonisation in monitoring practices** reflect a desire for consistency and efficacy, aiming to streamline the process across different operations and ensure uniformity in data sharing and welfare assessments. concerns are raised about specific issues, such as **disease control**, that are linked with legal compliance, underscoring the complex nature of monitoring, which spans health, legal, and operational domains.

A wider approach to monitoring is advocated, suggesting a holistic examination of farm systems and a variety of welfare aspects to ensure thorough and meaningful assessments. The emphasis on using **animal-based indicators in welfare assessments** highlights the move towards more meaningful and directly relevant measures of animal well-being. **specialised** focus on settings like farms and slaughterhouses is considered important for detailed surveillance and control, aligning with the broader goal of improving animal welfare through informed interventions.

The **development and refinement of monitoring practices** are highlighted as pathways to positive changes in animal welfare, with a particular emphasis on the egg and broiler industries, where specific challenges necessitate focused monitoring

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efforts. Practical approaches, including the **use of simple indicators and regular inspections**, are called for to enhance the effectiveness and applicability of monitoring systems.

Transport monitoring is identified as a critical area needing attention, reflecting the importance of welfare considerations throughout the entire lifecycle of the animals, including during transport phases. **On-farm applications and farmer engagement in monitoring processes** are discussed, indicating the need for ground-level implementation and compliance with regulatory frameworks. The acknowledgment of diverse systems and measures for welfare monitoring points to an understanding that **a one-size-fits-all approach may not suffice**, advocating for tailored solutions that address the unique needs and circumstances of different farming operations and animal species.

Table 10. Perspectives on animal welfare monitoring

Monitoring Aspect	Description
Fundamental Role	Monitoring is essential for identifying welfare issues, ensuring compliance with standards, and driving improvements in animal care.
Standard Integration	Effective monitoring integrates with welfare standards to ensure compliance and continuous care enhancement.
Harmonisation of Practices	There's a need for consistent and effective monitoring practices across operations to ensure uniform welfare assessments and data sharing.
Disease control and Legal compliance	Monitoring encompasses health, legal, and operational aspects, with disease control being a crucial focus for legal compliance.
Holistic Approach	A comprehensive monitoring strategy is advocated to cover all aspects of farm systems and animal welfare, ensuring thorough assessments.
Animal-based indicators	The emphasis is on using direct and relevant animal-based indicators for more nuanced welfare assessments.
Specialised Focus	Detailed surveillance in settings like farms and slaughterhouses is crucial for tailored interventions to enhance welfare.
Industry-specific challenges	The egg and broiler industries are highlighted for focused monitoring due to unique welfare challenges.

Monitoring Aspect	Description
Practical Approaches	Simple indicators and regular inspections are recommended to improve monitoring effectiveness and practicality.
Transport Monitoring	Monitoring during transport phases is crucial, emphasising welfare throughout the animals' lifecycle.
On-farm Applications	Engaging farmers in the monitoring process ensures on-ground implementation and adherence to welfare standards.
Tailored Solutions	Recognising diverse farming operations and animal needs, there's an advocacy for customised monitoring approaches to address specific challenges.

3.3.2.9. Willingness to Pay for Higher Welfare Meat

According to the respondents, the willingness of consumers to pay a premium for higher welfare meat is influenced by numerous factors and varies among different groups (Table 11). There is a general inclination to pay more, particularly when the benefits are clearly **communicated**, and **trust in labelling and standards** is established. The influence of food labelling is significant as consumers often look to labels for guidance on animal welfare standards. However, the variety and complexity of labels can lead to confusion. **Awareness** and access to detailed information about animal welfare practices are crucial in shaping consumer decisions, suggesting that **transparency** can enhance the likelihood of choosing higher welfare products.

Economic constraints and the broader economic context significantly impact the ability and willingness to make such choices. While some consumers are willing to pay a premium for higher welfare meat, this willingness is **not uniform across all groups**. **Financial trade-offs**, including considerations related to environmental impact and health benefits, also influence purchasing decisions. Despite a willingness to support better animal welfare, **price sensitivity and the availability of cheaper alternatives** pose substantial challenges, potentially deterring consistent choices of higher welfare options. **Market dynamics** and factors like **inflation**, add layers of complexity to consumer choices. Regional efforts and localised market examples show a range of willingness across different areas and demographics, with some regions demonstrating higher consumer engagement with animal welfare in their purchasing decisions.

Table 11. willingness to pay for higher welfare meat

Factor	Influence on consumer willingness
communication, trust, and awareness	clear communication about benefits, trustworthy labelling, and transparent information about animal welfare practices increase consumer willingness to pay a premium for higher welfare meat.
Economic constraints and price sensitivity	Broader economic contexts, individual financial limitations, and sensitivity to price, along with the availability of cheaper alternatives, can restrict consumer willingness to pay more.
Labelling and standards	Effective food labelling guides consumer choices, though complexity can cause confusion.
consumer segmentation	willingness to pay a premium varies among different consumer groups, influenced by various demographic and socioeconomic factors.
Financial and Ethical trade-offs	considerations of environmental impact, health benefits, and animal welfare concerns affect purchasing decisions.
Market Dynamics and Regional variability	competition with lower-priced products, economic factors like inflation, and regional differences in consumer engagement influence consumer choices.

3.3.2.10. Opinions on the aWISH project

The aWISH project gathered **positive feedback** from the participants for its dedicated focus on enhancing animal welfare throughout the production chain and particularly in slaughterhouses, indicating its perceived importance in the industry (Table 12). Its emphasis on monitoring welfare using specific indicators is acknowledged, pointing to the **project's practicality and potential for real-world application**. Stakeholders viewed the project as forward-looking, with the capacity to influence future legal standards and contribute to better systemic practices in animal welfare.

However, there was a realistic acknowledgment of the challenges inherent in implementing such welfare initiatives, especially within the operational constraints of slaughterhouses. The project's approach to data gathering, reporting, and information dissemination was well-regarded, though there are calls for even **more robust data handling** to deepen insights and impact. The incorporation of technology in assessing welfare was seen as an innovative aspect of aWISH, suggesting a progressive shift towards advanced and reliable methodologies in welfare monitoring. Expectations for

the project are high, with stakeholders finding it aligned with crucial objectives in the domain of animal welfare, hinting at optimism about its potential outcomes.

The project's ability to **improve public perception** and **increase awareness outside the industry** was valued, highlighting its role in educating and shifting narratives around animal welfare. The **development of new indicators and methods** was viewed positively, reflecting a desire for extensive improvements across the sector. Finally, there was an appreciation for the **project's focus on humane treatment** and the **adoption of correct practices**, emphasising the **ethical foundations of aWISH**. Its relevance was further underscored by its attention to current welfare issues and the aim to provide thorough assessments. The **collaborative nature of the project**, engaging various stakeholders including farmers, was strongly recognised, pointing to the importance of collective efforts in driving meaningful advancements in animal welfare.

Table 12. opinions on the aWISH project

Aspect	Insights from stakeholders
Project Impact	aWISH is seen as a significant initiative with the potential to improve animal welfare in the production chain, especially in slaughterhouses.
Monitoring and Indicators	The project's focus on specific welfare indicators is praised for its practicality and application in real-world scenarios.
Future Influence	Stakeholders believe aWISH could influence future legal standards and contribute to systemic improvements in animal welfare practices.
Implementation challenges	Acknowledgment of operational challenges in slaughterhouses, emphasising the need for realistic approaches in welfare enhancement.
Data Handling	The approach to data collection and dissemination is valued, with suggestions for more robust methods to enhance impact and insights.
Technological Innovation	The use of technology in welfare assessment is recognised as an innovative and forward-looking aspect of the project.
Public Perception	The project is appreciated for its potential to improve public understanding and awareness of animal welfare issues.
Development of New Methods	Positive reception of the project's efforts to develop new indicators and methods for animal welfare assessment.

Ethical considerations	The focus on humane treatment and ethical practices within aWISH is highlighted as a core strength of the project.
Collaborative Approach	The engagement of various stakeholders, including farmers, is seen as crucial for the project's success and the advancement of animal welfare.

3.3.2.11. Final thoughts

Final thoughts (Table 13) from stakeholders emphasised the critical role of **data utilisation** in bridging knowledge gaps and enhancing insights into animal welfare. There was a strong call for the agriculture industry to **embrace empathy, culture, and continuous improvement,** underscoring the importance of responsible practices. Concerns about **farm compliance** with welfare standards highlighted the need for attention and improvement in farm conditions and competitiveness.

Practical solutions that ease operator workload and enhance welfare application were also seen as vital for progress, while **public awareness** and a shift in societal values were deemed essential for fostering a transition toward better animal welfare practices. **Education and improvements within slaughterhouses** were specifically noted for their potential impact on welfare standards. Geographical distinctions were acknowledged, with a focus on addressing country-specific welfare needs and combating issues like greenwashing. The systemic balance between different farming systems and the integration of technology were further discussed, emphasising the need for a balanced and informed approach to welfare.

Stakeholders also stressed the availability of better alternatives in farming practices, informed by consumer choices that impact the market for animal products. **Collaborative stakeholder involvement** was emphasised as a cornerstone for effective welfare improvements, alongside the need for species-specific considerations that acknowledge the diversity in animal production. The **development of new methodologies** for data collection and welfare assessment was seen as a key outcome, with **legislation and knowledge transfer** playing key roles in fostering industry-wide welfare improvements. **Transport issues** were identified as critical areas needing attention. Lastly, **market dynamics**, cost considerations, and the influence of regulatory frameworks on space requirements and animal conditions were discussed, as additional factors influencing animal welfare and the potential ways to enhancement.

Table 13. Final thoughts

Key Focus Areas	Stakeholder Insights
Data Utilisation	Emphasised as essential for closing knowledge gaps and improving understanding of animal welfare.
Empathy and culture	The need for the agriculture industry to foster empathy and a culture of continuous improvement was highlighted.
Farm compliance	Concerns about farms adhering to welfare standards call for enhanced attention and improvement in farm conditions.
Practical solutions	Solutions that reduce operator workload and improve welfare application are crucial for progress.
Public Awareness	The shift in public perception and societal values is seen as vital for advancing animal welfare practices.
Education and Improvement	The potential impact of educational initiatives and improvements in slaughterhouses on welfare standards was noted.
Geographical variations	Addressing country-specific welfare needs and challenges, such as greenwashing, is essential for tailored welfare strategies.
Technology Integration	The balance between traditional farming systems and technological integration is crucial for informed welfare approaches.
Stakeholder collaboration	Collaborative efforts among stakeholders are fundamental for effective welfare improvements.
Species-specific considerations	Recognising and addressing the unique needs of different animal species in welfare practices is essential.
Methodology Development	Developing new methods for data collection and welfare assessment is key to advancing welfare practices.
Legislative Influence	Legislation and knowledge transfer are pivotal in promoting industry-wide welfare enhancements.
Transport Issues	Specific transport challenges, like the mixing of pigs, require urgent attention to improve animal welfare during transit.
Market Dynamics	The interaction between consumer choices, market demand, and regulatory frameworks influences welfare practices and improvements.

3.4. Discussion

The stakeholder interviews provided a comprehensive understanding of the various factors influencing the adoption of welfare-friendly approaches within the farm-to-

fork value chain. The key motivators for adopting these practices include increased public awareness, financial incentives, regulatory frameworks, certification schemes, and consumer willingness to pay for higher welfare products. Conversely, the significant barriers identified were lack of awareness and education, financial constraints, operational challenges, and inconsistent regulatory standards across regions. Notably, public awareness was consistently highlighted as a critical motivator. Financial incentives, such as price premiums for welfare-friendly products, alongside strong regulatory frameworks and certification schemes, were also viewed as essential in promoting better welfare standards.

On the other hand, the lack of awareness and education among both consumers and producers was cited as a major barrier. Without adequate knowledge, it is difficult to implement and sustain welfare improvements. Financial constraints also pose significant challenges, particularly in price-sensitive markets where the cost of transitioning to welfare-friendly systems can be prohibitive. Operational issues, such as modifying facilities, training staff, and maintaining consistent standards, further complicate adoption. Additionally, inconsistent regulatory frameworks across regions create competitive imbalances.

Finally, the interviews suggested several strategies to overcome these barriers. Targeted educational campaigns to raise awareness of animal welfare among both consumers and producers are essential. These campaigns should focus on the ethical benefits and marketability of welfare-friendly products. Financial support mechanisms, such as subsidies or tax incentives, could help reduce the economic burden on producers. Robust regulatory frameworks that ensure consistent standards across regions are also necessary to level the playing field. Certification schemes were recognised as crucial for building consumer trust and willingness to pay a premium for welfare-friendly products. Policymakers should support the development of clear, credible certification schemes that are transparent and accessible. Collaboration across the value chain–from farmers to retailers and policymakers–was identified as essential for sharing best practices and overcoming operational challenges.

4. EU survey

4.1. Introduction

This chapter presents the findings of the EU-level survey conducted to explore consumer attitudes and behaviours towards animal welfare-friendly meat products. By utilising a crowdsourcing approach, the survey captures a diverse and extensive range of perspectives from across the European Union. The data collected provides valuable insights into purchase intentions, willingness to pay, trust in certifications, and perceived responsibility towards animal welfare. Through detailed analysis, this chapter aims to inform stakeholders about consumer trends and preferences, supporting efforts to promote ethical and sustainable practices in the meat industry.

4.2. Methodology

A crowdsourcing approach was employed for the EU-level survey, to gather responses from consumers across the EU, administered in April 2024. Typically, crowdsourcing surveys gather data or feedback from a large, diverse group of participants through online platforms. Participants may contribute voluntarily or be incentivised with rewards. The main advantage is the ability to access a wide pool of respondents, leading to diverse perspectives and insights.

For this survey, we utilised the Prolific platform to collect the responses and the SurveyMonkey platform to create and design the questionnaire, which included questions covering a variety of factors to explore various dimensions, including purchase intentions, willingness to pay, attitudes towards animal welfare and environmental impacts, trust in certifications, perceived behavioural control, subjective norms, and personal values. The following subsections provide an overview explanation of the sample that participated in the survey and the theoretical background underpinning out study.

4.2.1. Theoretical framework

As mentioned before, the EU-level survey aimed to evaluate the attitudes and behaviours of EU residents regarding animal welfare-friendly meat products. A particular goal of theoretical framework underpinning the survey was to establish a theoretical bridge between the desk research findings and the outcomes of the

stakeholder interviews with the EU survey, providing a comprehensive understanding of consumer behaviour towards animal welfare-friendly meat products. The EU survey was based on insights gathered from both the desk research and the stakeholder interviews, ensuring a well-rounded approach to understanding consumer attitudes and behaviours. By integrating the findings from these multiple sources, the survey aimed to validate and expand upon the preliminary insights, offering a robust basis for developing targeted strategies to promote welfare-friendly practices across the EU.

The survey consisted of a total of **56 multiple-choice questions**, covering various behavioural (most of them in a 1 – *strongly disagree* to 5 – *strongly agree* scale) and socio-demographic factors. The theoretical framework guiding the EU survey is grounded in two well-established theories: the **Theory of Planned Behaviour (TPB)** and the **Value-Belief-Norm (VBN) theory**. These theories were selected for their proven efficacy in predicting and explaining consumer behaviour, particularly in contexts involving ethical and environmental considerations. By leveraging TPB, we can understand how attitudes, subjective norms, and perceived behavioural control shape the intentions and behaviours of individuals towards purchasing animal welfare-friendly meat products. Simultaneously, the VBN theory allows us to explore the value-driven motivations, encompassing biospheric, altruistic, and egoistic values, which influence consumers' personal norms and pro-environmental behaviours. Notably, to the best of our knowledge, this study is among the first that apply the VBN theory in the context of animal welfare, providing a novel perspective on consumer behaviour in this area. Together, these theories provide a powerful framework that enriches our analysis, ensuring a thorough examination of the factors at play. The dependent variables utilised in the present research were purchase intention (INT) and willingness to pay (WTP). Finally, trust in certification schemes was also assessed. A detailed explanation of the theoretical framework underpinning the present study can be found in Annex – section 7.1, while the questionnaire utilised in the EU-level survey is available in Annex – section 7.3.

4.2.2. Sampling

Before conducting the main survey, a **pilot study** with **200 participants** was undertaken to refine the survey and ensure the reliability and validity of the questions. This preliminary step helped identify potential issues and allowed for adjustments to improve the overall study design and user-friendliness. The **initial sample** of the **main**

survey included **5,149 respondents**. After excluding responses that failed the attention checks or were incomplete, the **final sample** comprised **5,064 respondents**, surpassing the respective KPI of *5,000 responses*[2]. Section 4.3.1 provides a detailed description of the respondents' profile, based on various socio-demographic characteristics.

4.3. EU Survey Analysis

In this section, a detailed analysis of the data collected from the EU-level survey is presented. It examines various dimensions of consumer behaviour and attitudes towards animal welfare-friendly meat products. The analysis is structured to provide insights into the socio-demographic profiles of the respondents, their purchase intentions, willingness to pay, trust in certification, attitudes towards animal welfare, and perceived responsibility levels. Also, a cross-tabular analysis between these socio-demographic characteristics and the examined factors is included to explore relationships and uncover patterns that can inform strategies for promoting animal welfare-friendly meat consumption across the EU. The following subsections describe the specifics of the survey findings, offering a comprehensive understanding of consumer perspectives on animal welfare-friendly products.

4.3.1. Participants' socio-demographic profile

The following subsection provides a detailed overview of the basic sample statistics. The mean age of the respondents was 30.7 years, with a standard deviation of 9.5 years, reflecting a young and middle-aged population distribution. Participants represented most of the EU countries, ensuring a diverse geographical spreading. Gender distribution among the respondents confirmed sample's gender diversity, with 41.9% identifying as females, 56.2% as males, 1.5% as non-binary, and 0.4% preferring not to say or identifying as other.

The educational background of the sample exhibited a range of attainment levels. Specifically, 3.28% had completed advanced graduate work or a Ph.D., and 35.23% held a bachelor's degree. A small portion (0.69%) did not complete their highest level of education, while high school or GED completion was reported by 17.54% of respondents

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[2] aWISH GA 101060818, Part A, p. 13

and 27.39% held a master's degree. The survey also captured the economic background of the participants by assessing net annual household income. The distribution revealed that 27.88% of the respondents fell into the low-income bracket (less than €15,000), 49.19% into the middle-income bracket (€15,001 - €45,000), and 22.93% into the high-income bracket (more than €45,001).

4.3.2. Consumer Attitudes and Behaviours

This section presents specific groups of questions designed to provide detailed insights into consumer behaviour and attitudes towards animal welfare-friendly meat products. The analysis focuses on five key areas: **purchase intention, willingness to pay, trust in certification, attitudes**, and **responsibility levels.**

4.3.2.1. Purchase Intention of animal welfare-friendly meat products

Respondents' intentions regarding the purchase of animal welfare-friendly meat products are analysed in the present subsection. The survey reveals varying levels of commitment to buying these products both in the future and during their next shopping trip. Additionally, it assesses the conscious decision-making process of choosing welfare-friendly options over conventional ones.

The responses (Table 14) indicate a generally positive future intention to purchase animal welfare-friendly meat products, with many respondents planning to support these products over time. Immediate purchase intentions, on the other hand, are more varied, with a lower mean suggesting that while some consumers plan to buy welfare-friendly products soon, many are undecided or less committed to making this change immediately. Finally, the intention to consciously choose welfare-friendly products over non-welfare-friendly ones indicates a moderate level of deliberate consumer behaviour, reflecting an awareness and willingness to make ethical choices when shopping for meat products.

Overall, these results highlight a trend toward increasing consumer support for animal welfare-friendly meat products, with varying levels of immediacy and conscious decision-making among the respondents.

Table 14. Purchase Intention of Animal welfare-friendly Meat Products on a scale from 1 – strongly disagree to 5 – strongly agree (Mean, Median, SD)

Question	Mean	Median	SD
I am planning to buy animal welfare-friendly meat products in the future.	3.58	4.00	1.06
The next time that I will do my shopping, I will buy animal welfare-friendly meat products.	3.04	3.00	1.07
I am planning to consciously buy animal welfare-friendly meat products instead of products that are not.	3.31	3.00	1.13

4.3.2.2. Willingness to pay for animal welfare-friendly animal products

This group examines the financial commitment of respondents towards supporting animal welfare-friendly products. The questions focus on the extra percentage consumers are willing to pay to endorse welfare-friendly efforts and their willingness to choose these products even when cheaper alternatives are available.

The responses (Table 15) show a moderate willingness to pay an additional percentage for animal welfare-friendly products. While some consumers are ready to support these efforts financially, others may be less inclined, reflecting the diversity in economic priorities and capacities. Moreover, the willingness to choose welfare-friendly products despite cheaper alternatives highlights a moderate to strong consumer inclination towards ethical purchasing. This suggests that a significant portion of respondents values animal welfare over cost savings.

In conclusion, these results indicate a general readiness among consumers to pay more for animal welfare-friendly products, with varying degrees of financial commitment and ethical consideration influencing their purchasing decisions.

Table 15. Willingness to pay extra for Animal welfare-friendly Products on a scale from 1 – strongly disagree to 5 – strongly agree (Mean, Median, SD)

Question	Mean	Median	SD
I would be willing to pay this extra percentage on products to support the organisation's/product efforts to be animal welfare friendly. (on a scale from 1 to 6)	2.89	3.00	1.18

I am willing to pay for and buy animal welfare-friendly meat products even if a cheaper and less friendly meat product is next to it in the supermarket. (on a scale from 1 – strongly disagree to 5 – strongly agree)	3.11	3.00	1.14

4.3.2.3. Trust in certification of animal welfare-friendly animal products

Evaluations on the level of consumer trust in the certification and labelling of animal welfare-friendly meat products can be found in the present subsection. Perceptions regarding the quality, traceability, and commitment of farms associated with these labels are explored, reflecting consumer confidence in the integrity of welfare-friendly certifications.

Respondents generally believe that the quality of meat products with an animal welfare label is better ensured, indicating a strong trust in the certification's ability to guarantee higher standards. Additionally, the responses reflect confidence in the traceability of welfare-labelled meat products, suggesting that consumers trust these labels to hold producers accountable for any substandard practices. Furthermore, there is a strong belief among respondents that farms offering welfare-labelled meat products are committed to ongoing improvements, reinforcing trust in the ethical and business practices associated with these labels.

In general, the results (Table 16) indicate a high level of consumer trust in the certification of animal welfare-friendly meat products. Respondents perceive these labels as reliable indicators of quality, accountability, and continuous improvement in farming practices.

Table 16. Trust in certification of Animal welfare-friendly products on a scale from 1 – strongly disagree to 5 – strongly agree (Mean, Median, SD)

Question	Mean	Median	SD
I think the quality of meat products with an animal welfare label is better guaranteed.	3.64	4.00	1.00
I think the traceability of meat products with an animal welfare label can find the accountable unit for substandard meat.	3.64	4.00	0.90

I think if a farm provides meat products with an animal welfare label, it means it is committed to continuously improving its business and production.	3.70	4.00	0.94

4.3.2.4. Attitudes towards animal welfare-friendly meat products

This subsection examines the general attitudes of respondents towards buying animal welfare-friendly meat products. It assesses the perceived benefits of these products on both the environment and animal welfare, highlighting the ethical and environmental motivations behind consumer behaviour.

The responses strongly indicate that consumers believe it is beneficial to purchase animal welfare-friendly meat products, reflecting a positive ethical stance and widespread support for such practices. There is also a significant belief among respondents that consuming welfare-friendly meat products benefits the environment, suggesting that environmental concerns are a key factor in their purchasing decisions. In addition, the responses indicate a strong consensus that buying welfare-friendly meat products positively impacts animal welfare, demonstrating a high level of consumer awareness and ethical commitment to improving animal welfare standards.

To summarise, these results (Table 17) highlight a positive consumer attitude towards animal welfare-friendly meat products. Respondents not only recognise the ethical benefits, but also appreciate the positive environmental impact, underscoring the value they see in supporting welfare-friendly practices.

Table 17. Attitudes Towards Animal welfare-friendly Meat Products on a scale from 1 – strongly disagree to 5 – strongly agree (Mean, Median, SD) (Mean, Median, SD)

Question	Mean	Median	SD
I think that it is good to buy animal welfare-friendly meat products.	4.28	4.00	0.83
I believe that consuming animal welfare-friendly meat products has a positive impact on the environment.	3.78	4.00	1.06
I believe that consuming animal welfare-friendly meat products has a positive contribution to animal welfare.	4.19	4.00	0.92

4.3.2.5. Consumers' responsibility levels regarding animal welfare

Finally, in this subsection we evaluate the extent to which respondents feel personally responsible for animal welfare issues. It explores various aspects of responsibility, from general accountability to specific impacts on production animals and the role of individuals compared to the government and food industry.

The responses (Table 18) suggest that many consumers acknowledge some level of shared responsibility for animal welfare issues, indicating an awareness of their role in contributing to these problems, but with slightly less conviction of personal accountability. Also, it seems that respondents feel a bit personally responsible for the stress experienced by animals before slaughter. However, there is a divided opinion on whether individual contributions to animal welfare problems are significant, with many respondents remaining neutral or uncertain. Many respondents feel that they, along with governmental and industry entities, play a role in the consumption of non-animal welfare-friendly meat. And finally, a notable portion of respondents believe individuals can indeed contribute to improving animal welfare, although there is still a significant minority who feel individual efforts are insufficient.

Overall, while there is a general recognition of shared responsibility, individual perceptions vary, with some respondents feeling more accountable than others for specific aspects of animal welfare issues.

Table 18. Consumers' Responsibility Levels Regarding Animal Welfare on a scale from 1 – strongly disagree to 5 – strongly agree (Mean, Median, SD)

Question	Mean	Median	SD
I am jointly responsible for animal welfare problems.	3.22	3.00	1.08
I feel jointly responsible for the animal welfare problems of production animals.	3.09	3.00	1.13
I feel jointly responsible for the increased stress level of production animals before they get slaughtered.	2.94	3.00	1.17
My contribution to animal welfare problems is negligible.	3.16	3.00	1.03
Not only the government and food industry are responsible for high non-animal welfare-friendly meat consumption, but me too.	3.26	3.00	1.09

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In principle, individuals at their own cannot contribute to an increase of animal welfare.	2.82	3.00	1.11

4.3.3. cross-tabulation analysis of socio-demographics and consumer attitudes and behaviours

In this section, we present a cross-tabulation analysis between the socio-demographic characteristics of the respondents and the key factors analysed in section 4.3.2. By using the mean values of each group of questions for better representation, this analysis aims to explore the relationships and patterns between different demographic groups and their attitudes, behaviours, and intentions towards animal welfare-friendly meat products. This approach provides deeper insights into how various demographic variables, such as age, gender, education and income, influence consumer perspectives and decision-making processes regarding animal welfare-friendly products.

4.3.3.1. cross-tabulation results by Age Group

Table 19. Cross-tabulation results by Age Group – mean (SD)

	Purchase intention	Willingness to pay	Trust in certification	Attitudes towards AWF meat products	Responsibility levels
18-24	3.13 (± 0.993)	2.80 (± 1.080)	3.61 (± 0.794)	4.07 (± 0.824)	3.01 (± 0.737)
25-34	3.30 (± 0.987)	2.90 (± 1.180)	3.65 (± 0.787)	4.07 (± 0.800)	3.09 (± 0.774)
35-44	3.46 (± 0.939)	2.97 (± 1.280)	3.70 (± 0.791)	4.08 (± 0.778)	3.13 (± 0.794)
45-54	3.60 (± 0.958)	2.98 (± 1.270)	3.78 (± 0.785)	4.14 (± 0.780)	3.25 (± 0.790)
55-64	3.77 (± 0.873)	3.09 (± 1.360)	3.87 (± 0.818)	4.25 (± 0.679)	3.25 (± 0.835)
65+	3.39 (± 1.130)	3.03 (± 1.430)	3.70 (± 0.944)	4.03 (± 0.742)	3.14 (± 1.030)

Purchase intention is generally consistent across age groups, showing a gradual increase as age rises, peaking at 3.77 (± 0.873) in the 55-64 age group. Younger consumers (18-24) display the lowest purchase intention at 3.13 (± 0.993), suggesting a slightly lower interest in purchasing AWF meat products. The data reflects a positive trend as individuals aged 55-64 are more likely to intend to purchase AWF meat, perhaps due to increased awareness or personal ethical values developed over time.

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Willingness to pay follows a similar pattern, with older age groups displaying a higher average willingness to pay, with those aged 55-64 having the highest mean score of 3.09 (± 1.36). Interestingly, the 18-24 group reports the lowest willingness to pay at 2.80 (± 1.08), indicating that younger consumers may be more price-sensitive or less inclined to pay a premium for welfare standards. The 55-64 age group appears more financially capable or willing to support welfare initiatives through higher-priced products. **Trust in certification** generally increases with age, with the 55-64 group showing the highest level of trust (3.87 ± 0.818), while the youngest age group (18-24) shows a relatively lower level of trust (3.61 ± 0.794). This suggests that older consumers may place greater confidence in certification schemes, perhaps due to their higher engagement with or understanding of such frameworks. This correlates with increased marketability among this demographic.

Attitudes towards AWF meat products remain consistently high across all age groups, ranging from 4.03 to 4.25, with minor differences. The highest score is observed in the 55-64 age group (4.25 ± 0.679), followed closely by the 45-54 age group (4.14 ± 0.780). This reflects a generally positive attitude towards AWF meat, suggesting broad acceptance and recognition of the benefits associated with these products across all age groups, particularly in middle-aged to older demographics. Regarding **responsibility** levels, older age groups again score higher, with the 55-64 group and 45-54 group displaying the highest levels of perceived responsibility at 3.25 (± 0.835 and ± 0.790, respectively). The youngest group (18-24) has the lowest mean score at 3.01 (± 0.737), suggesting a lower sense of personal responsibility for animal welfare issues. This difference may reflect varying levels of awareness or concern about the ethical treatment of animals among younger versus older populations.

To summarise, the data highlights notable trends where older age groups (45-64) generally display higher purchase intention, willingness to pay, trust in certification, positive attitudes towards AWF products, and perceived responsibility for animal welfare. In contrast, younger age groups (18-34) tend to exhibit lower scores in these areas, possibly due to greater price sensitivity, lower engagement with certification schemes, or less personal responsibility towards welfare issues.

4.3.3.2. Cross-tabulation results by Gender Identity

Table 20. Cross-tabulation results by Gender Identity – mean (SD)

	Purchase intention	Willingness to pay	Trust in certification	Attitudes towards AWF meat products	Responsibility levels
Female	3.55 (± 0.944)	3.11 (± 1.18)	3.82 (± 0.752)	4.28 (± 0.729)	3.29 (± 0.704)
Male	3.12 (± 0.982)	2.72 (± 1.15)	3.54 (± 0.799)	3.93 (± 0.816)	2.93 (± 0.787)
Non-binary	3.29 (± 1.00)	3.07 (± 1.23)	3.72 (± 0.862)	4.08 (± 0.901)	3.13 (± 0.806)
Other	3.62 (± 0.911)	3.29 (± 1.11)	3.52 (± 0.790)	4.05 (± 0.731)	3.55 (± 0.864)
Prefer not to say	4.03 (± 0.995)	3.31 (± 1.25)	3.56 (± 0.927)	4.36 (± 0.976)	3.53 (± 0.720)

The data shows that those who prefer not to disclose their gender identity report the highest **purchase intention** at 4.03 (± 0.995), followed by individuals identifying as "other" at 3.62 (± 0.911) and females at 3.55 (± 0.944). Males exhibit the lowest purchase intention score of 3.12 (± 0.982). These findings suggest that individuals who do not conform to traditional gender binaries or choose not to specify their gender might have a stronger inclination to purchase AWF meat products, whereas males appear to be less inclined compared to other groups.

Those who prefer not to say their gender identity also show the highest **willingness to pay** at 3.31 (± 1.25), followed by "other" (3.29 ± 1.11) and females (3.11 ± 1.18). Males report the lowest willingness to pay at 2.72 (± 1.15), indicating that traditional male consumers may be less inclined to spend extra for AWF meat products compared to other groups. The relatively higher willingness to pay among individuals from non-binary and "other" groups suggests greater financial support for welfare-friendly practices among these categories. **Trust in certification** is highest among females (3.82 ± 0.752), followed by the non-binary group (3.72 ± 0.862). Males report lower trust in certification (3.54 ± 0.799), with individuals identifying as "other" having the lowest score at 3.52 (± 0.790). The higher trust in certification among females and non-binary individuals may reflect a greater level of engagement with welfare standards and labelling, contributing to their increased likelihood of purchasing AWF meat products.

In terms of **attitudes towards AWF meat products**, the highest positive attitudes are exhibited by individuals who prefer not to disclose their gender (4.36 ± 0.976), followed closely by females (4.28 ± 0.729). Males display the lowest level of positive attitudes at 3.93 (± 0.816), showing a weaker alignment with AWF products compared to other groups. Overall, the data suggests that gender groups outside of the male category hold more favourable attitudes towards AWF products, which correlates with higher purchase intentions. Those who identify as "other" report the highest sense of **responsibility** towards animal welfare (3.55 ± 0.864), followed by individuals who prefer not to say their gender (3.53 ± 0.720) and females (3.29 ± 0.704). Males report the lowest responsibility levels at 2.93 (± 0.787). This finding suggests that individuals in non-traditional gender categories or those who choose not to disclose their gender may feel a stronger personal responsibility for animal welfare compared to traditional male consumers.

In conclusion, the results show that females, non-binary individuals, and those preferring not to disclose their gender generally demonstrate higher purchase intentions, willingness to pay, trust in certification, and positive attitudes towards AWF meat products, alongside greater perceived responsibility for animal welfare. In contrast, males consistently report lower scores across all metrics, suggesting they may be less engaged with welfare-friendly meat products.

4.3.3.3. Cross-tabulation results by Educational Background

Table 21. Cross-tabulation results by Educational Background – mean (SD)

	Purchase Intention	Willingness to pay	Trust in certification	Attitudes towards AWF meat products	Responsibility levels
Advanced Graduate work or Ph.D.	3.60 (± 1.06)	3.25 (± 1.42)	3.65 (± 0.894)	4.06 (± 0.865)	3.21 (± 0.857)
Master's Degree	3.42 (± 0.959)	2.96 (± 1.18)	3.69 (± 0.787)	4.12 (± 0.790)	3.16 (± 0.748)
Bachelor's Degree	3.29 (± 0.975)	2.88 (± 1.17)	3.66 (± 0.787)	4.08 (± 0.775)	3.08 (± 0.775)
Some college	3.26 (± 0.985)	2.86 (± 1.17)	3.68 (± 0.787)	4.11 (± 0.793)	3.07 (± 0.748)

High school/GED	3.17 (± 1.02)	2.78 (± 1.16)	3.60 (± 0.791)	4.01 (± 0.847)	2.97 (± 0.798)
Did not complete	3.13 (± 1.24)	2.51 (± 0.951)	3.60 (± 0.963)	4.02 (± 0.967)	2.93 (± 0.840)

The highest **purchase intention** is observed among individuals with advanced graduate work or a Ph.D. (3.60 ± 1.06), followed by those with a master's degree (3.42 ± 0.959). Those who did not complete formal education show the lowest purchase intention at 3.13 (± 1.24). This suggests that higher educational attainment correlates with a stronger intention to purchase AWF meat products, potentially due to increased awareness and ethical considerations fostered through education.

Similarly, those with advanced graduate work or a Ph.D. exhibit the highest **willingness to pay** (3.25 ± 1.42), while individuals who did not complete formal education report the lowest willingness to pay (2.51 ± 0.951). This pattern indicates that individuals with higher education levels are more willing to support welfare-friendly practices financially, aligning with the trend of greater ethical concern seen in more educated groups. **Trust in certification** shows minor variations across educational groups, with individuals holding a master's degree reporting the highest trust in certification (3.69 ± 0.787). This is closely followed by those with bachelor's degrees (3.66 ± 0.787). Trust in certification tends to be slightly lower among individuals with high school/GED or those who did not complete formal education, both at 3.60, although still relatively strong across all educational levels. The data indicates that trust in certification is generally high but slightly more pronounced among those with higher education levels.

Attitudes towards AWF meat products are generally positive across all educational groups, with individuals holding a master's degree reporting the most positive attitudes (4.12 ± 0.790), followed closely by those with some college education (4.11 ± 0.793) and bachelor's degrees (4.08 ± 0.775). Those with high school/GED report the lowest attitudes towards AWF meat (4.01 ± 0.847), though the variation between educational levels is minimal, reflecting broad overall support for AWF products. Individuals with advanced graduate work or a Ph.D. report the highest perceived **responsibility** levels (3.21 ± 0.857), followed by those with a master's degree (3.16 ± 0.748). Responsibility levels decrease slightly as educational attainment decreases, with those who did not complete formal education reporting the lowest responsibility level at 2.93 (± 0.840). This trend suggests that higher education may foster a greater sense of personal responsibility for animal welfare, potentially due to increased knowledge or ethical engagement.

In summary, the results suggest that higher levels of educational attainment are associated with greater purchase intention, willingness to pay, trust in certification, positive attitudes towards AWF products, and perceived responsibility for animal welfare. In particular, individuals with advanced degrees (master's or Ph.D.) consistently score higher across all factors, indicating a stronger overall commitment to supporting welfare-friendly practices. Those with lower levels of education, particularly those who did not complete formal schooling, tend to show lower scores across these metrics, though still demonstrating positive attitudes and trust in certification.

4.3.3.4. Cross-tabulation results by income group

Table 22. Cross-tabulation results by income group – mean (SD)

	Purchase Intention	Willingness to pay	Trust in certification	Attitudes towards AWF meat products	Responsibility levels
€5.000 or less	3.17 (± 1.03)	2.66 (± 1.20)	3.58 (± 0.824)	4.05 (± 0.844)	3.06 (± 0.758)
€5.001 – €15.000	3.23 (± 0.975)	2.81 (± 1.15)	3.63 (± 0.781)	4.08 (± 0.803)	3.06 (± 0.766)
€15.001 – €25.000	3.25 (± 0.977)	2.84 (± 1.15)	3.69 (± 0.780)	4.09 (± 0.791)	3.09 (± 0.744)
€25.001 – €35.000	3.32 (± 0.977)	2.94 (± 1.14)	3.68 (± 0.769)	4.07 (± 0.787)	3.09 (± 0.768)
€35.001 – €45.000	3.40 (± 0.958)	2.92 (± 1.11)	3.70 (± 0.758)	4.13 (± 0.771)	3.11 (± 0.807)
€45.001 – €55.000	3.37 (± 0.972)	2.94 (± 1.20)	3.61 (± 0.814)	4.03 (± 0.837)	3.09 (± 0.746)
€55.001 – €65.000	3.40 (± 1.02)	3.06 (± 1.31)	3.65 (± 0.858)	4.10 (± 0.832)	3.07 (± 0.853)
€65.001 – €75.000	3.45 (± 1.06)	3.14 (± 1.27)	3.68 (± 0.860)	4.05 (± 0.818)	3.13 (± 0.855)
€75.001 or more	3.52 (± 0.994)	3.20 (± 1.32)	3.69 (± 0.822)	4.11 (± 0.740)	3.17 (± 0.781)

Purchase intention generally increases with income, with the highest intention observed in individuals earning €75,001 or more (3.52 ± 0.994), followed by those earning between €65,001 and €75,000 (3.45 ± 1.06). The lowest purchase intention is among individuals earning €5,000 or less (3.17 ± 1.03). This suggests that higher-income groups

are more inclined to purchase AWF meat products, potentially due to greater financial flexibility or heightened awareness of ethical considerations.

Willingness to pay similarly increases as income rises, with individuals earning €75,001 or more exhibiting the highest willingness to pay (3.20 ± 1.32). The lowest willingness to pay is seen in the lowest income bracket, €5,000 or less (2.66 ± 1.20). This indicates that wealthier individuals are more likely to spend a premium on welfare-friendly meat products, possibly reflecting fewer financial constraints. **Trust in certification** varies only slightly across income groups, with individuals earning between €35,001 and €45,000 reporting the highest trust in certification (3.70 ± 0.758). Those earning €5,000 or less report the lowest level of trust in certification (3.58 ± 0.824). The relatively consistent levels of trust suggest that certification schemes are generally seen as reliable across income levels, though higher income groups might trust these labels more due to greater exposure or knowledge of such schemes.

Attitudes towards AWF meat products are highly positive across all income brackets. Individuals earning between €35,001 and €45,000 show the highest positive attitudes (4.13 ± 0.771), while those earning €45,001 to €55,000 report the lowest attitudes, although still quite positive (4.03 ± 0.837). The consistency of these scores reflects strong acceptance of AWF products across different income levels, with slight variations that may be influenced by financial or social factors. **Responsibility** levels show minor fluctuations across income groups. Individuals in the highest income bracket (€75,001 or more) report the highest sense of responsibility (3.17 ± 0.781), followed by those earning between €65,001 and €75,000 (3.13 ± 0.855). Individuals earning €5,000 or less show the lowest responsibility levels (3.06 ± 0.758). Overall, the data suggests that wealthier individuals might feel a greater sense of responsibility towards animal welfare, potentially due to increased awareness or resources to act on such concerns.

In general, higher income groups exhibit stronger purchase intention, greater willingness to pay, and a higher sense of responsibility towards animal welfare-friendly products. Trust in certification and positive attitudes towards AWF meat products are consistent across all income groups, indicating broad confidence in welfare certification schemes and general support for AWF products, regardless of financial capacity. However, individuals in lower income brackets demonstrate slightly lower willingness to pay and responsibility levels, which could be attributed to financial limitations.

4.4. conclusions

The EU-level survey provides valuable insights into the attitudes and behaviours of EU residents regarding animal welfare-friendly meat products. With a final sample of **5,064 respondents**, the survey offers a detailed view of consumer perspectives across various socio-demographic factors. The analysis reveals several key findings:

✓ **Purchase intention:** The survey indicates a generally positive future intention among respondents to purchase animal welfare-friendly meat products. Females and older age groups show a higher propensity to buy these products. Higher educational levels and income groups are also associated with greater purchase intentions.

✓ **willingness to pay:** There is a moderate willingness among respondents to pay an additional percentage for animal welfare-friendly products. Females, older age groups, and those with higher educational levels and income groups are more inclined to financially support animal welfare initiatives.

✓ **Trust in certification:** The findings suggest a high level of trust in the certification of animal welfare-friendly products. Females, older age groups, and individuals with higher educational levels and income show greater confidence in certification processes, perceiving them as reliable indicators of quality and ethical practices.

✓ **Attitudes Towards Animal welfare-Friendly Meat Products:** Respondents exhibit positive attitudes towards buying animal welfare-friendly meat products, with strong beliefs in the ethical and environmental benefits. Females, older age groups, and those with higher educational levels and income demonstrate more positive attitudes.

✓ **consumers' Responsibility Levels:** The survey highlights a general recognition of shared responsibility for animal welfare issues among respondents. Females, older age groups, and individuals with higher educational levels and income feel more responsible for animal welfare problems, indicating an awareness of their role in contributing to these issues.

overall, the survey findings underscore the importance of promoting animal welfare-friendly meat products and enhancing consumer awareness and trust in certification processes. The diverse demographic representation ensures that the insights are robust and generalizable across the EU population.

5. Advanced Analysis and synthesis

5.1. Introduction

This chapter presents the advanced analysis conducted as part of Task 5.4, focusing on the key findings from stakeholder interviews and the EU-level survey. The objective of this analysis is to identify common themes, differences, and unique insights derived from both the qualitative and quantitative data sources. By integrating the perspectives of various stakeholders across the farm-to-fork value chain and the attitudes and behaviours of EU consumers, this analysis aims to provide a comprehensive understanding of the factors influencing the adoption of welfare-friendly practices in the meat production industry.

The analysis is structured into two main subsections: the first subsection presents the findings from an advanced analysis of the stakeholder interviews, and the second subsection details the results of the EU-level survey meta-analysis. The analysis leverages advanced analytical methods, including Large Language Models and structural Equation Modelling, to derive meaningful insights from the collected data. The integration of these methods allows for a robust examination of the underlying factors that drive or hinder the implementation of animal welfare improvements, providing valuable guidance for policymakers, producers, and other stakeholders in the meat production value chain.

Overall, the findings from this advanced analysis highlight the importance of understanding the diverse needs, perceptions, and constraints of stakeholders and consumers alike. By addressing these factors through targeted strategies and collaborative efforts, the aWISH project aims to promote higher welfare standards and support the transition towards more ethical and sustainable meat production practices across Europe.

5.2. Stakeholder Interviews

A particular objective of the stakeholder interviews (as described in aWISH Grant Agreement - Part B, p. 25), was to identify <u>15 key barriers and motivators</u>[3] that facilitate or hinder:

[3] aWISH GA 101060818, Part B, p. 25

1. the adoption of welfare-friendly approaches,
2. the collection and sharing of data at different stages of the production process, and
3. the use of data-driven decision support tools.

To objectively assess and cluster the most relevant topic interpretations generated by LDA into the above categories, we integrated a Large Language Model (LLM) into our interview analysis solution (Figure 2), namely the open-source model Falcon-180B (Almazrouei et al., 2023), ensuring a robust and scalable further analysis of the interview data. LLMs represent the state-of-the-art in the Natural Language Processing field, with capabilities to comprehend and generate human-like text (Chang et al., 2023). open-source models on the other hand, offer transparency and flexibility, allowing researchers to adapt the model to their specific needs, audit the training data, and modify the model's architecture or training process if necessary. we ensured that the utilisation of the LLM model adhered to the EU AI Act (European Commission, 2021) and the living guidelines on the responsible use of Generative AI in research (European Commission, 2024).

combining LDA with the advanced capabilities of LLMs within a secure Python-based environment enabled us to enhance the precision and depth of our analysis. More specifically, the language model, after being provided with the relevant context through proper prompt engineering, could interpret and categorise the topics derived from LDA (Figure 5). This integration allowed us to effectively identify and clarify the key barriers and motivators in the stakeholder interviews, providing comprehensive insights into the subtleties affecting the adoption of welfare-friendly practices, data sharing, and the use of decision support tools.

Figure 5. Key motivators/barriers extraction process
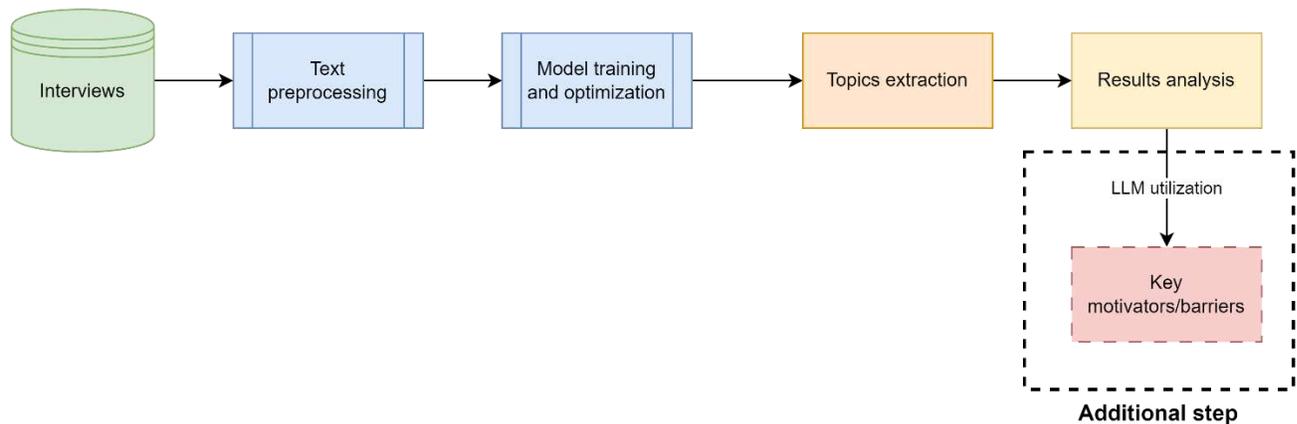
with this approach, a total of **26 key motivators and barriers** that either *facilitate* or *hinder* the implementation of welfare-friendly practices across the value chain were successfully identified, surpassing the respective KPI. These factors, as described in the following sections, provide a detailed understanding oΨf the dynamics at play in the project's focus area, and can inform the development of targeted strategies for improving animal welfare standards.

5.2.1. Motivators and barriers for adopting welfare-friendly approaches

Table 23 provides a detailed overview of the key motivators and barriers influencing the adoption of welfare-friendly practices within the value chain. The motivators section highlights factors such as public awareness, financial incentives, regulatory frameworks, and consumer willingness-to-pay that can drive improvements in animal welfare. Conversely, the barriers section identifies challenges such as financial constraints, operational difficulties, inconsistent regulations, and low market demand that can hinder the implementation of these practices. Understanding these factors is essential for developing effective strategies to promote higher welfare standards in the industry.

Table 23. Motivators and barriers for adopting welfare-friendly approaches

Adoption of welfare-friendly Approaches	
Motivators	**Barriers**
• **Enhanced public awareness** can drive welfare improvements. • **Financial benefits** from higher welfare products can motivate producers. • **certification schemes** can encourage the adoption of higher welfare standards. • **strong regulatory frameworks** can drive welfare-friendly practices. • **Training and education** can facilitate improvements in animal welfare. • **consumers' willingness-to-pay** can encourage producers to adopt higher welfare standards.	• **Lack of awareness and education** hinders the adoption of welfare practices. • **Financial constraints** impede the implementation of welfare measures. • consumers' preference for cheaper products (**price sensitivity**) can discourage higher welfare standards. • **operational difficulties** in farms and slaughterhouses can obstruct welfare improvements. • **inconsistent regulatory frameworks** and standards across regions and countries can impede welfare adoption. • **Low market demand** for welfare-friendly products can deter producers. • **Misconceptions about animal welfare** can limit the adoption of better practices.

5.2.2. Motivators and barriers for effective collection and sharing of data

Identifying motivators and barriers for effective data collection and sharing is crucial for understanding how data practices can be enhanced to support animal welfare strategies. Our analysis highlighted several factors that either facilitate or impede the efficient management and dissemination of data across the value chain (see Table 24).

Table 24. Motivators and barriers for effective collection and sharing of data

Effective collection and sharing of Data	
Motivators	**Barriers**
• **Technological advancements** can support better data collection and sharing. • when **industry leaders prioritise data collection and sharing**, it influences broader adoption. • **Regulations that mandate data collection and sharing** can motivate compliance.	• **Insufficient data integration** at various stages limits informed decision-making. • **operational difficulties** in data collection and sharing due to farm and slaughterhouse challenges. • **Inconsistent data reporting and sharing** regulatory frameworks can be an obstacle.

5.2.3. Motivators and barriers for the utilisation of data-driven tools in animal production

with regard to the utilisation of data-driven tools in animal production (Table 25), the analysis identified several motivators and barriers that influence the adoption and effective use of these technologies. understanding these factors is critical for promoting the integration of data-driven tools into animal production processes to enhance decision-making and improve animal welfare outcomes.

Table 25. Motivators and barriers for the utilisation of data-driven tools in animal production

Utilisation of Data-Driven Tools in Animal Production	
Motivators	**Barriers**
• **Development of user-friendly and effective tools** can facilitate adoption. • **Enhancing skills and knowledge about tools** can promote their use. • **Evidence-based benefits of tool usage** can motivate adoption.	• **High costs of advanced tools** can limit their adoption. • **Limited knowledge** about data-driven tools can hinder their utilisation. • **Lack of clear guidelines** on tool usage can be a barrier.

Utilisation of Data-Driven Tools in Animal Production	
• **Emphasis on data-driven decision-making from industry leaders** can encourage tool utilisation.	

In summary, the thorough analysis of stakeholder interviews using LDA and LLMs enabled us to uncover a comprehensive array of key barriers and motivators impacting several critical areas within the value chain. By leveraging advanced natural language processing techniques, we were able to derive useful insights into the factors that influence the adoption of welfare-friendly practices, the efficiency and effectiveness of data collection and sharing, and the utilisation of data-driven decision support tools. These findings offer a rich foundation for understanding the complex current landscape and highlight the multidimensional challenges and opportunities present in each focus area.

5.3. EU survey

The initial stage of the EU survey analysis provided significant insights into the general trends and factors influencing consumer preferences and willingness to pay for higher welfare meat products. However, to derive deeper and more actionable insights into the underlying structures and relationships between various factors affecting consumer decisions, it is essential to perform a more sophisticated analysis. By employing advanced statistical methods, we aim to uncover latent variables and model complex interactions that descriptive statistics cannot fully explore.

To achieve this, we have selected Structural Equation Modelling – SEM (Kelloway, 1995) as our advanced analysis technique. SEM is particularly suitable for this study because it allows for the examination of multiple relationships simultaneously, incorporating both direct and indirect effects. This methodology provides a robust framework for validating our theoretical models and gaining deeper insights into consumer behaviour patterns. By conducting this advanced analysis using SEM, we aim to gain a comprehensive understanding to enhance consumer engagement with higher welfare meat products and improve animal welfare standards.

More particularly, we employed Partial Least Squares Structural Equation Modelling (PLS-SEM), a variance-based SEM technique, which is ideal for exploratory research and

theory development (Sarstedt et al., 2021). PLS-SEM is remarkably effective in handling complex models with numerous constructs and indicators, and it is robust against non-normal data distributions. This approach allows us to evaluate both the measurement model (assessing the reliability and validity of the constructs) and the structural model (examining the relationships between the constructs). By leveraging PLS-SEM, we can simultaneously test multiple hypotheses and gain useful insights into the drivers of consumer behaviour, ultimately providing a more comprehensive understanding of the factors that influence the adoption of welfare-friendly meat products. The aim is by utilising these results to enable stakeholders develop targeted strategies and precise marketing and policy interventions, by identifying key factors influencing consumer decisions.

In this study, the analysis focused on comparing the two aforementioned theoretical models (see Annex - 7.1 for a detailed overview) to understand consumer intentions and behaviours toward animal welfare-friendly meat products. To analyse the acquired data, the Partial Least Square Structural Equation Modelling (PLS-SEM) method was employed using SmartPLS 4.0 software[4] (Ringle et al., 2015). Compared to the traditionally used covariance-based structural equation modelling (CB-SEM) method, PLS-SEM imposes fewer restrictive requirements and assumptions regarding large sample sizes and the normality of the data, while maintaining robustness in estimations (Cassel, Hackl & Westlund, 1999).

The study employed established guidelines by Hair, Ringle, and Sarstedt (2011) to assess reliability and validity in both models. Internal consistency reliability was evaluated through Cronbach's alpha coefficients and composite reliability (CR), while convergent and discriminant validity were checked using AVE values, Fornell-Larcker criteria, and the Heterotrait-Monotrait (HTMT) ratio. Section Annex - 7.7 offers an overview of the evaluation tests, while section Annex - 7.8 presents the detailed results.

In the TPB model, which predicts consumers' purchase intentions and willingness to pay (WTP) for animal welfare-friendly meat products, three constructs—attitude (ATT), subjective norm (SN), and perceived behavioural control (PBC)—were analysed. The constructs demonstrated satisfactory internal consistency, with Cronbach's alpha ranging from 0.767 to 0.814. Composite reliability values ranged from 0.862 to 0.889. The

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[4] License No.: T01-S9F5A1444X-C2E4CC69C23A456683C9757D94F5D64C8D6

AVE values were above the recommended threshold of 0.50 for all constructs, except for PBC, which scored slightly below (0.465). This suggests that while convergent validity was generally strong, the PBC construct was somewhat weaker. Finally, the HTMT ratios and the Fornell-Larcker criterion confirmed that each latent variable's square root of AVE was higher than its correlation with other variables, ensuring discriminant validity. VIF values, all below 5, indicated no issues with multicollinearity.

Regarding the results, the TPB model explained 40.3% of the variance in purchase intention and 18% of the variance in WTP. Attitudes (β = 0.336, p < .001) were found to be the strongest predictor of purchase intentions, followed by subjective norms (β = 0.276, p < .001) and perceived behavioural control (β = 0.197, p < .001). In terms of WTP, attitude was again the most significant determinant (β = 0.217, p < .001), followed by subjective norm (β = 0.190, p < .001) and perceived behavioural control (β = 0.159, p < .001).

In the VBN model, values such as altruistic, biospheric, and egoistic were examined to understand their influence on ecological beliefs, personal norms, and ultimately, purchase intention and WTP. The constructs in the VBN model also displayed high internal consistency, with cronbach's alpha values ranging from 0.652 to 0.819 and CR values from 0.771 to 0.890. All constructs showed strong convergent validity, with AVE values above 0.50. Additionally, similar to the TPB model, the VBN model met discriminant validity requirements through HTMT ratios and the Fornell-Larcker criterion. Multicollinearity was not a concern, as VIF values were all below 5.

The VBN model explained 39.1% of the variance in purchase intention and 23.7% of the variance in WTP. Personal norms (β = 0.625, p < .001) were the strongest predictor of both purchase intention and WTP, followed by general awareness of consequences and the new ecological paradigm (NEP). This highlights the importance of moral obligations and value-driven motivations in predicting consumer behaviour regarding animal welfare.

Both models underwent fit evaluations to ensure robustness. The Goodness-of-Fit (GOF) for the TPB and VBN models were 0.461 and 0.467, respectively, indicating a good fit for both. Standardised Root Mean square Residual (SRMR) values for both models were below the threshold of 0.08 (TPB = 0.078, VBN = 0.055), confirming a satisfactory model fit. In terms of predictive power, the R^2 values for the TPB and VBN models indicated moderate predictive accuracy for purchase intention and WTP. Additionally, the f^2

effect sizes and path coefficients between latent variables in both models were statistically significant.

Finally, in the comparison of the predictive performance of the two models using the cross-validated Predictive Ability Test (CVPAT) and PLS-SEM metrics, the TPB model showed better predictive performance for purchase intention, with an average loss of 0.790 compared to 1.145 for the VBN model. The t-statistic of 23.977 (p < .001) confirmed the superiority of TPB in this area. Conversely, the VBN model outperformed the TPB model in predicting WTP, with an average loss of 1.370 compared to 1.146 for TPB. The Bayesian Information Criterion (BIC) further supported this distinction, with the TPB model showing a lower BIC (-2581.603) for purchase intention but a higher BIC for WTP (-971.562) compared to the VBN model. This demonstrates the VBN model's strength in understanding the deeper, value-driven motivations that lead consumers to pay a premium for animal welfare-friendly products.

5.4. Discussion

The present discussion section synthesises findings from both stakeholder interviews and the EU-level consumer survey, integrating qualitative and quantitative data to provide broad insights into the adoption of welfare-friendly practices within the farm-to-fork value chain. This combined analysis allows us to draw meaningful conclusions on the key factors influencing these practices, highlighting both common themes and unique perceptions.

5.4.1. Stakeholder Interviews

The stakeholder interviews revealed that the adoption of welfare-friendly approaches is driven by a complex interplay of motivators and barriers. Key motivators include enhanced public awareness, financial incentives, regulatory frameworks, certification schemes, and consumer willingness to pay for higher welfare products. Conversely, significant barriers encompass lack of awareness and education, financial constraints, operational challenges, and inconsistent regulatory standards across regions and countries.

Enhanced public awareness emerged as a critical motivator. Participants noted that informed consumers are more likely to support and demand higher welfare standards, driving producers to adopt better practices. Financial incentives, such as

price premiums for welfare-friendly products, also play a pivotal role. Strong regulatory frameworks and certification schemes are essential in promoting and ensuring compliance with welfare standards. However, the lack of awareness and education among both consumers and producers presents a significant barrier. Stakeholders emphasised that without adequate knowledge and understanding of welfare practices, implementing and sustaining improvements is challenging. Financial constraints, particularly the high costs associated with transitioning to welfare-friendly systems, are another major barrier. This is especially problematic in regions where consumers are highly price-sensitive, making it difficult for producers to justify the additional costs without sufficient market demand.

Operational challenges within farms and slaughterhouses further complicate the adoption of welfare-friendly approaches. Modifying existing facilities, training staff, and maintaining consistent welfare standards are significant hurdles. Additionally, the inconsistency in regulatory frameworks and standards across different regions creates an uneven playing field. Producers in stricter regions might be at a competitive disadvantage compared to those in areas with more lenient regulations.

5.4.2. EU Survey

The meta-analysis for the EU survey provided valuable insights into the psychological determinants of consumer behaviour concerning animal welfare-friendly meat products, by applying and comparing the Theory of Planned Behaviour and the Value-Belief-Norm theory. Our findings reveal that both theoretical models are effective in predicting consumers' purchase intentions and willingness to pay (WTP) for these products, albeit with distinct strengths and emphases.

For the TPB model, **attitudes towards animal welfare-friendly meat products** emerged as the most significant predictor of both purchase intention and WTP, underscoring the importance of positive consumer perceptions and attitudes. *subjective norms* and *perceived behavioural control* also played critical roles, highlighting the influence of social pressures and perceived ease of purchase on consumer behaviour. In contrast, the VBN model emphasised the role of **personal norms** as the strongest predictors for both purchase intention and WTP. This underscores the importance of moral obligations and value-driven motivations in driving pro-animal welfare behaviours. The hierarchical structure of the VBN model,

where values influence beliefs and subsequently personal norms, was also supported, demonstrating its robustness in capturing the value-driven aspects of consumer behaviour.

The comparison of the two models showed that while the TPB model had a slight advantage in predicting purchase intentions, the VBN model performed better in explaining consumers' WTP a premium for animal welfare-friendly products. This distinction highlights the complementary strengths of both models in understanding different dimensions of consumer behaviour. Moreover, the application of VBN theory to an animal welfare context extends its utility beyond environmental psychology, demonstrating its versatility in predicting behaviour across different domains. The TPB model's applicability in predicting consumer behaviours related to animal welfare was also confirmed, providing a comprehensive understanding of the psychological mechanisms underlying ethically and ecologically driven consumerism.

5.4.3. Synthesis of results

The synthesis of the results from the stakeholder interviews and the EU survey identified common themes and differences, providing a comprehensive understanding of the factors influencing the adoption of welfare-friendly practices. Several motivators and barriers were highlighted in the interviews, while the survey provided insights into consumer attitudes and preferences, including:

- **Public Awareness and Education**: The interviews emphasised the importance of public awareness and education in driving the adoption of welfare-friendly practices. Informed consumers are more likely to support higher welfare standards, while a lack of awareness among both consumers and producers hinders progress. The survey did not specifically address the impact of public awareness on adoption practices but underscored the importance of consumer knowledge in their willingness to pay for higher welfare products.
- **Financial Incentives and constraints**: Financial incentives, such as price premiums for welfare-friendly products, were identified as significant motivators in the interviews. However, financial constraints, particularly the high costs associated with transitioning to welfare-friendly systems, were major barriers. The survey supported the finding that consumers are willing to

pay a premium for higher welfare products, indicating potential financial incentives for producers.

- **Regulatory Frameworks and certification schemes**: strong regulatory frameworks and credible certification schemes are essential for promoting and ensuring compliance with welfare standards, as highlighted in the interviews. Inconsistent regulatory standards across regions create challenges for producers, highlighting the need for harmonised regulations. The survey did not directly address regulatory frameworks but indicated that clear and trustworthy labelling is crucial for consumer confidence and willingness to pay.
- **operational challenges**: operational challenges within farms and slaughterhouses, such as modifying facilities, training staff, and maintaining consistent welfare standards, were significant barriers identified in the interviews. The survey did not specifically address these operational challenges but provided insights into consumer demand and preferences, which indirectly influence operational practices.
- **consumer Demand and Market Potential**: The survey highlighted a strong consumer willingness to pay for higher welfare products, indicating substantial market potential. This finding aligns with the stakeholder interviews, where participants noted that consumer demand drives producers to adopt better practices.

6. General conclusions

The deliverable **D5.2 - value chain actors' needs, perceptions, constraints analysis** of the aWISH project, funded by the European Union's Horizon Europe programme, evaluated the social aspects of meat-producing livestock welfare across Europe. It analysed the needs, perceptions, and constraints of key actors in the farm-to-fork value chain, including producers, regulators, veterinarians, policymakers, industry representatives, and consumers. Using a multilevel approach, the study incorporated desk research, stakeholder interviews, and an EU-level consumer survey to assess public awareness and attitudes towards animal welfare. The findings, synthesised through advanced analyses, identified barriers and motivators for adopting welfare-friendly practices, which informed policy recommendations and strategic initiatives to improve animal welfare.

First, the **stakeholder interviews** encompassed a diverse group of participants, including sector regulators, policymakers, farmers, transport companies, food industry representatives, veterinarians, welfare NGOs, and scientific experts. The qualitative insights from these interviews revealed a complex interplay of factors influencing the adoption of welfare-friendly practices.

Key motivators identified include:

- ✓ **Enhanced Public Awareness**: Informed consumers are more likely to demand higher welfare standards, driving producers to adopt better practices.
- ✓ **Financial Incentives**: Price premiums for welfare-friendly products and other financial supports can encourage the adoption of improved welfare practices.
- ✓ **Regulatory Frameworks and certification schemes**: strong regulatory frameworks and credible certification schemes are crucial for promoting and ensuring compliance with welfare standards.

Conversely, **significant barriers** were also highlighted:

- ✓ **Lack of Awareness and Education**: Both consumers and producers often lack adequate knowledge about welfare practices hindering implementation.
- ✓ **Financial constraints**: The high costs associated with transitioning to welfare-friendly systems are a major barrier particularly in price-sensitive regions.

- ✓ **operational challenges**: Modifying existing facilities, training staff and maintaining consistent welfare standards present significant operational difficulties.
- ✓ **Inconsistent Regulatory standards**: variations in regulations across regions create an uneven playing field complicating compliance and competitiveness.

Furthermore, the **EU-level consumer survey** provided quantitative data to validate and complement the qualitative insights from stakeholder interviews. The survey revealed several critical trends:

- ✓ **Positive Purchase Intentions**: A generally positive intention to purchase animal welfare-friendly meat products was observed, particularly among females, older age groups, and individuals with higher educational levels and incomes.
- ✓ **Willingness to Pay (WTP)**: There is a moderate willingness to pay a premium for higher welfare products, with similar demographic patterns as purchase intentions.
- ✓ **Trust in certification**: High levels of trust in certification processes were noted, underscoring their importance in consumer decision-making.
- ✓ **Responsibility for Animal welfare**: Many consumers recognise their shared responsibility for animal welfare, indicating a broad awareness of ethical considerations.

Finally, the **advanced analysis** integrated findings from both stakeholder interviews and the EU survey, offering a holistic understanding of the factors influencing welfare-friendly practices. several key insights emerged:

- ✓ **Public Awareness and Education**: The importance of public awareness and education was underscored as critical for driving the adoption of welfare-friendly practices.
- ✓ **Financial Incentives and constraints**: while financial incentives are significant motivators, financial constraints remain a substantial barrier.
- ✓ **Regulatory and certification schemes**: consistent regulatory standards and credible certification schemes are essential for promoting welfare-friendly practices.

✓ **Consumer Demand and Market Potential**: consumers display a strong willingness to pay for higher welfare products, indicating substantial market potential.

The findings from this deliverable have several important implications for policy and practice:

➢ **Educational campaigns**: There is a clear need for targeted educational campaigns to raise awareness about animal welfare issues among both consumers and producers. These campaigns should disseminate information about the benefits of welfare-friendly practices from ethical, quality, and marketability standpoints.

➢ **Financial support mechanisms**: Financial support mechanisms, such as subsidies or tax incentives, could mitigate economic barriers faced by producers. Policies that provide financial assistance for adopting welfare-friendly technologies and practices can encourage more stakeholders to make necessary investments.

➢ **Harmonised Regulatory Frameworks**: Establishing and enforcing robust regulatory frameworks that ensure consistent welfare standards across regions can level the playing field and promote broader adoption of welfare-friendly practices.

➢ **Certification schemes**: clear, credible, and widely recognised certification schemes are crucial for building consumer trust and willingness to pay a premium for welfare-friendly products. Policymakers should support the development and promotion of accessible and transparent certification schemes.

➢ **Collaborative Efforts**: collaboration among stakeholders is essential for effective welfare improvements. The interviews highlighted the importance of cooperative efforts across the value chain, from farmers and transporters to retailers and policymakers. such collaboration can facilitate the sharing of best practices, technological innovations, and effective strategies for overcoming operational challenges.

In conclusion, Deliverable D5.2 offers a comprehensive analysis of the factors influencing the adoption of welfare-friendly practices within the farm-to-fork value chain. The integration of qualitative and quantitative data provided a deeper understanding of the motivators and barriers involved. By addressing the identified

challenges through targeted initiatives and collaborative efforts, the adoption of higher welfare standards can be significantly enhanced, ultimately contributing to improved animal welfare and a more sustainable meat production industry.

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7. Annex

7.1. Theoretical Framework

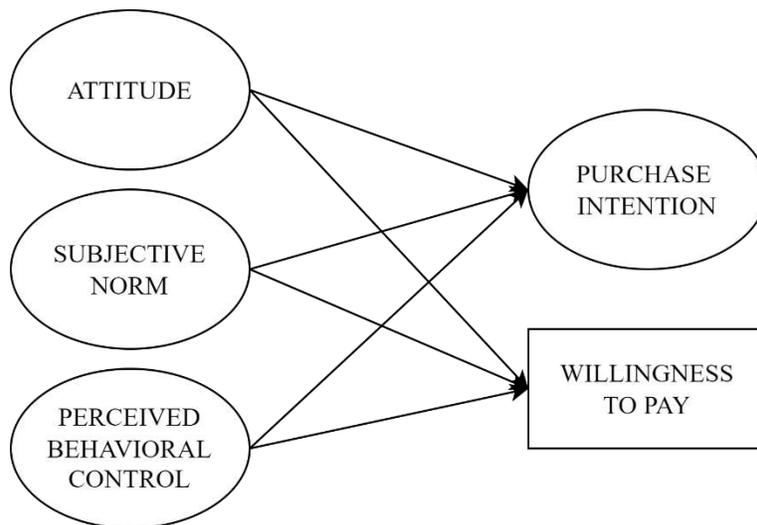### 7.1.1. Theory of Planned Behaviour

The **Theory of Planned Behaviour (TPB)**, developed by Ajzen (1991), provides an extensive framework for understanding and predicting human behaviour across various contexts, particularly where behaviour is influenced by social pressures and perceived control. TPB theorises that behavioural intention, the most proximal predictor of behaviour, is shaped by three key components (Figure 6): *attitude*, *subjective norm*, and *perceived behavioural control* (Kaiser, 2005).

Attitude toward a behaviour refers to an individual's positive or negative appraisal of engaging in a specific activity (Bagozzi, 1992). This judgement is driven by beliefs about the outcomes of the behaviour, weighted by the perceived importance of these outcomes (Montano & Kasprzyk, 2015). If an individual believes that performing the behaviour will lead to favourable outcomes, they are more likely to have a positive attitude towards it, which in turn strengthens their intention to perform the behaviour (Ajzen, 1991). **Subjective norm** represents the social pressure individuals feel from their reference group (family, friends, colleagues, etc.) to perform or refrain from certain behaviours (Parker et al, 1995; De Vries et al., 1988). An individual's motivation to comply with these expectations also influences their behavioural intentions. The stronger the perceived social pressure, the more likely an individual is to intend to perform the behaviour (Ajzen, 1991).

Finally, **perceived behavioural control** (PBC) refers to an individual's perception of their ability to perform the behaviour (Kraft et al, 2005). This construct incorporates both internal factors, such as skills and knowledge, and external factors, such as obstacles and opportunities. PBC reflects the perceived ease or difficulty of performing the behaviour, influenced by past experiences and anticipated impediments (Ajzen, 1991). When individuals believe they have greater control over the behaviour, they are more likely to form strong intentions to perform it.

Figure 6. Theoretical model of WTP and Purchase intention based on the Theory of Planned Behaviour. Circles denote latent constructs; squares denote observed variables.

In the present study, we employed a set of instruments to measure the construct variables in the Theory of Planned Behaviour, specifically attitudes (ATT), subjective norms (SN) and perceived behavioural control (PBC), with each question being assessed on a scale from 1 (strongly disagree) to 5 (strongly agree). The scales used for these latent constructs were adapted from prior literature relevant to organic and animal welfare-friendly food consumption (Beldad & Hegner, 2020; Al-swidi et al., 2014). Table 26 presents a summary of the questions utilised for each construct.

Table 26. TPB constructs

Coding	Construct/Question	Reference
ATT	Attitudes towards animal welfare-friendly meat products	Beldad, A. & Hegner, S. (2020)
ATT1	I think that it is good to buy animal welfare-friendly meat products.	
ATT2	I believe that consuming animal welfare-friendly meat products has a positive impact on the environment.	
ATT3	I believe that consuming animal welfare-friendly meat products has a positive contribution to animal welfare.	

coding	construct/question	*Reference*
SN	**subjective norms**	*Al-swidi, A., Mohammed Rafiul Huque, S., Haroon Hafeez, M. & Noor Mohd Shariff, M. (2014)*
SN1	The trend of buying animal welfare-friendly meat products among people around me is increasing.	
SN2	People around me generally believe that it is better for health to use animal welfare-friendly meat products.	
SN3	My close friends and family members would appreciate if I bought animal welfare-friendly meat products.	
SN4	I would get all the required support (money, time, information related) from friends and family to buy animal welfare-friendly meat products.	
PBC	**Perceived behavioural control**	
PBC1	I can take the decision independently to buy animal welfare-friendly meat products.	
PBC2	I have the financial capability to buy animal welfare-friendly meat products.	
PBC3	I have the time to go for buying animal welfare-friendly meat products.	
PBC4	I have complete information and awareness regarding where to buy animal welfare-friendly meat products.	
PBC5	Animal welfare-friendly meat products are readily available in the location where I reside.	
PBC6	I can handle any (money, time, information related) difficulties associated with my buying decision.	

7.1.2. Value-Belief-Norm theory

The **value-belief-norm (VBN)** theory (Figure 7), on the other hand, developed by Stern (Stern et al., 1995; Stern et al., 1999; Stern, 2000), offers a compact framework for understanding the motivations and behaviours related to environmental action and social participation. The VBN theory theorises that individual values drive beliefs about the environment, which then form personal norms that ultimately guide pro-environmental behaviours (Kaiser, 2005). The VBN theory builds on three foundational theories. First, Schwartz and Bilsky's Universal Theory of Human Values (1987) suggests that values are guiding principles influencing attitudes and actions. This provides a basis for understanding how different types of values, such as biospheric, altruistic, and egoistic, can influence behaviour. Second, Schwartz's Norm Activation Model (1977) explains how personal norms are activated by awareness of consequences and

ascription of responsibility, leading to altruistic and pro-social behaviours. Third, the New Environmental Paradigm (Dunlap et al., 2000) assesses societal beliefs about the environment and human impacts on the biosphere, providing a framework for understanding ecological worldviews.

In the VBN model, *values* are the fundamental principles guiding individuals' attitudes and behaviours. These values are categorised into three types: biospheric, altruistic, and egoistic. **Biospheric values** emphasise respect and protection for the environment and the ecosystem. Individuals with strong biospheric values prioritise ecological well-being (Ünal et al., 2019). **Altruistic values** focus on the welfare and interests of others, motivating individuals by the desire to help and benefit society (Kim & Seock, 2019). **Egoistic values** are centered on self-interest and personal benefit, where individuals prioritise their own needs over those of others or the environment (Hansla et al., 2008).

Beliefs in the VBN model are shaped by these values and, in turn, influence how individuals perceive the environment, in a hierarchical model (López-Mosquera & Sánchez, 2012). A key component here is the ecological worldview, which is assessed by the **New Environmental Paradigm** (NEP). This paradigm measures general beliefs about the relationship between humans and the environment (Dunlap et al., 2000).

Additionally, **general awareness of consequences** reflects an individual's recognition of the potential negative impacts of their actions on the environment. **Ascription of responsibility** refers to the extent to which individuals feel accountable for these adverse outcomes (Schwartz, 1977), resulting in a sense of moral obligation towards the environment, or the activation of a **personal norm** for action (López-Mosquera & Sánchez, 2012). This last variable of the model is what directly determines behaviour and that all the other variables in the theory may have indirect effects through *norms*, as well as in some cases direct effects net of norms (Stern et al., 1999; Nordlund & Garvill, 2002).

Figure 7. Hierarchical model of WTP and purchase intention based on the value-belief-norm theory. Circles denote latent constructs; squares denote observed variables.
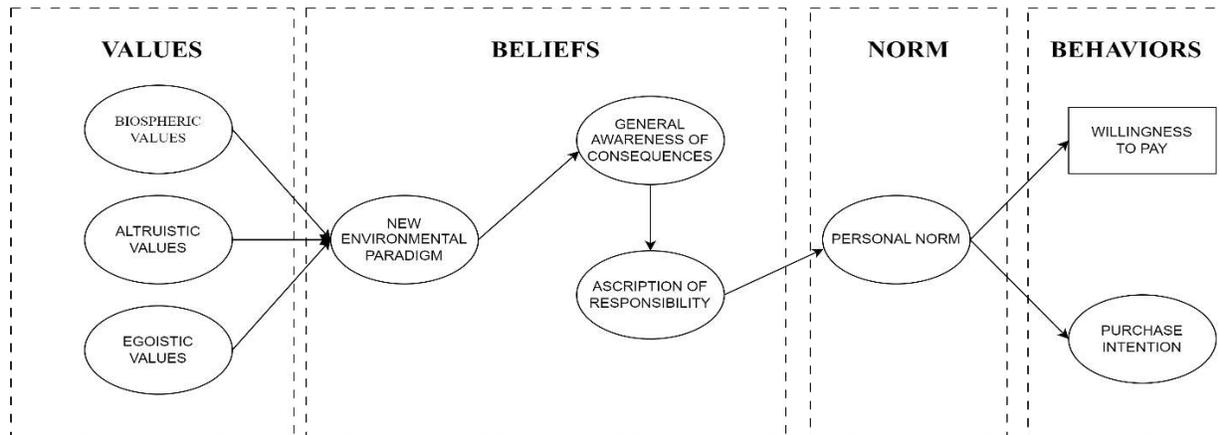
To apply the VBN theory in our study, were measured the central constructs of the VBN theory, including altruistic values (AV), egoistic values (EV), biospheric values (BV), new environmental paradigm (NEP), general awareness of consequences (GAC), ascription of responsibility (AR) and personal norms (PN), via scales selected and adapted from Rosenthal (2022), Hoeksma et al. (2017), Thøgersen and Ölander (2006) and Zhang et al. (2020). All questions were assessed on a scale from 1 (strongly disagree) to 5 (strongly agree). Table 27 provides an overview of the questions used per construct.

Table 27. VBN constructs

	Construct/question	Reference
GAC	**General Awareness of consequences**	Hoeksma, D. L., Gerritzen, M. A., Lokhorst, A. M. & Poortvliet, P. M. (2017)
GAC1	Buying animal welfare-friendly meat products will indirectly decrease the stress level of production animals.	
GAC2	It is a problem that people do not buy animal welfare-friendly meat products.	
GAC3	The welfare of production animals will improve if we buy more animal welfare-friendly meat products.	
GAC4	Low animal welfare is a problem for society.	
NEP	**New Environmental paradigm**	Rosenthal, S. (2022)
NEP1	Humans are severely abusing the environment.	
NEP2	Despite our special abilities, humans are still subject to the laws of nature.	

	construct/question	Reference
NEP3	The Earth is like a spaceship with very limited room and resources.	
NEP4	The balance of nature is very delicate and easily upset.	
NEP5	Plants and animals have as much right as humans to exist.	
NEP6	If things continue their present course, we will soon experience a major ecological catastrophe.	
AR	Ascription of Responsibility	
AR1	I am jointly responsible for animal welfare problems.	
AR2	I feel jointly responsible for the animal welfare problems of production animals.	
AR3	I feel jointly responsible for the increased stress level of production animals before they get slaughtered.	Hoeksma, D. L., Gerritzen, M. A., Lokhorst, A. M. & Poortvliet, P. M. (2017)
AR4	My contribution to animal welfare problems is negligible.	
AR5	Not only the government and food industry are responsible for high non-animal welfare-friendly meat consumption, but me too.	
AR6	In principle, individuals at their own cannot contribute to an increase of animal welfare.	
PN	Personal Norm	
PN1	I feel I should choose animal welfare-friendly products instead of conventional animal products for the sake of animal welfare.	Thøgersen, J. & Ölander, F. (2006)
PN2	I get a bad conscience if I choose conventional instead of animal welfare-friendly products.	
AV	Altruistic Values	
AV1	It is important to me that every person has equal opportunities.	
AV2	It is important to me that every person is treated justly.	Zhang, L., Ruiz-Menjivar, J., Luo, B., Liang, Z. & Swisher, M. E. (2020)
AV3	It is important to me that there is no war or conflict.	
AV4	It is important to me to take care of those who are worse off.	
EV	Egoistic Values	
EV1	It is important to me to have control over others' actions.	

	construct/question	*Reference*
EV2	It is important to have authority over others.	
EV3	It is important to have money and possessions.	
BV	**Biospheric values**	
BV1	It is important to me to prevent environmental pollution.	
BV2	It is important to me to respect nature.	
BV3	It is important to me to be in unity with nature.	

7.1.3. Dependent variables

Regarding the dependent variables utilised in the present research, **purchase intention (INT)** refers to the likelihood that consumers will buy a particular product or service based on their attitudes and preferences (Chang & Wildt, 1994). In this study, the purchase intention of participants was measured using three questions (De Leeuw et al., 2014; Beldad & Hegner, 2020). Specifically, participants were asked to rate statements such as "*I am planning to buy animal welfare-friendly meat products*" (INT1), "*The next time that I will do my shopping, I will buy animal welfare-friendly meat products*" (INT2) and "*I am planning to consciously buy animal welfare-friendly meat products instead of products that are not*" (INT3) on a scale from 1 (strongly disagree) to 5 (strongly agree). This allowed for a quantifiable measure of their intentions to make such purchases. The **willingness to pay (WTP)** for animal welfare-friendly animal products was assessed using the question "*I would be willing to pay this extra percentage on products to support the organisation's/product's efforts to be animal welfare-friendly*", as explained in section 4.3.3.

7.1.4. Other constructs

Apart from the instruments acting as independent variables we described above, we also assessed consumers' trust in certification schemes, adopting the approach described in Gould (1988), using the following questions on a scale from 1 (strongly disagree) to 5 (strongly agree), as described below (Table 28).

Table 28. Trust in certification construct

Trust in certification	
TC1	I think the quality of meat products with an animal welfare label is better guaranteed.
TC2	I think the traceability of meat products with an animal welfare label can find the accountable unit for substandard meat.
TC3	I think if a farm provides meat products with an animal welfare label, it means it is committed to continuously improving its business and production.

To ensure participants were responding attentively, an attention check question was included. Selection criteria were implemented to ensure the suitability of participants, requiring a fluent level of English and excluding individuals following specific diets, such as vegans and vegetarians, due to the study's focus on animal welfare-friendly meat products. The questions were identified from relevant scientific literature and tailored to the specific requirements of our study. The findings from the EU-level survey derived from an extensive descriptive and statistical analysis, are presented in section 4.3.

7.2. Interviews questionnaire

PART 1 || BACKGROUND INFORMATION

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1. which of the following stakeholder group do you associate with?

    ☐scientific experts (various domains)
    ☐welfare ngos & networks
    ☐farmer or farmer organisations
    ☐veterinarians & advisors
    ☐local catching teams and transport companies
    ☐slaughterhouses
    ☐food industry / retail
    ☐consumers' organisations
    ☐certification & standardization organisations
    ☐policy makers
    ☐ other: …

2. your gender:
    ☐female
    ☐male
    ☐diverse / non-binary
    ☐rather not to say

3. your country and region: _____

4. what is your highest educational degree achieved?
    ☐less than high school diploma
    ☐high school diploma
    ☐some college, but no degree
    ☐bachelor's degree or equivalent
    ☐master's degree or equivalent
    ☐doctorate or professional degree

5. Your age:
☐18-24
☐25-34
☐35-44
☐45-54
☐55-64
☐65 and above
☐rather not say

PART 2 || FACTORS INFLUENCING ADOPTION OF WELFARE-FRIENDLY APPROACHES

Question 1 | Est. Duration: 4 min – 5 min

1. What are the factors, in your opinion, that facilitate or hinder the adoption of welfare-friendly approaches?

Question 2 | Est. Duration: 4 min – 5 min

2. What obstacles and opportunities do you perceive in adopting welfare-friendly approaches in relation to yourself or other stakeholders?

PART 3 || UNDERSTANDING AND PERCEPTION OF ANIMAL WELFARE

Question 3 | Est. Duration: 4 min – 5 min

3. Can you describe, from your experience, what a good life means for a farm animal?

Question 4 | Est. Duration: 4 min – 5 min

4. What do you associate with positive animal welfare (regarding the five freedoms or the perspective or the interviewee)?

Question 5 | Est. Duration: 4 min – 5 min

5. DO you place a substantial amount of significance on animal welfare?

| QUESTION 6 | EST. DURATION: 4 min – 5 min |

6. Is there anything you want to change regarding animal living conditions from farm up to the slaughterhouse?

_____

PART 4 || CONSUMER BEHAVIOR AND INDUSTRY AWARENESS

_____

| QUESTION 7 | EST. DURATION: 4 min – 5 min |

7. Are you well informed about animal-friendly production practices?

| QUESTION 8 | EST. DURATION: 4 min – 5 min |

8. what is your opinion regarding the monitoring of animal welfare?

| QUESTION 9 | EST. DURATION: 4 min – 5 min |

9. DO you believe that consumers are willing to pay a premium price for higher welfare meat?

_____

PART 5 || FINAL THOUGHTS

_____

| Final thoughts. | EST. DURATION: 8 min – 10 min |

10. what is your overall opinion of the awish project?
11. would you like to share any final thoughts? Anything you consider important to highlight?

7.3. EU level survey questionnaire

aWISH – EU Level Survey

welcome note

Dear participant, welcome to our survey!

The survey lasts approximately 10 minutes. There are no right or wrong answers, this is about your views. All data is anonymised, and your privacy is guaranteed.

Thank you for helping us gather relevant information!

what is aWISH all about?

aWISH is an EU funded (Horizon Europe) project aiming to develop and offer a cost-efficient solution to evaluate and improve the welfare of meat producing livestock at a large scale, across Europe. This approach will be developed and evaluated in close collaboration with all actors involved, from primary producers up to policy makers and citizens.

Your participation in this survey will significantly contribute to understanding public attitudes and preferences regarding animal welfare in meat production. By sharing your views, you play a key role in helping us comprehend the perspectives and priorities of the aWISH project's target groups, allowing us to address current concerns more effectively and enhance the adoption of the project's outcomes, ultimately contributing to the improvement of animal welfare practices across the meat production industry in Europe.

STUDY TITLE

A consumer survey on Animal welfare of meat producing livestock in Europe.

DEFINITIONS

According to the world organisation for Animal Health (WOAH), Animal welfare means "the physical and mental state of an animal in relation to the conditions in which it lives and dies". Animal welfare-friendly meat products refer to meat products that are produced with consideration for the physical and mental state of the animals, ensuring they are healthy, comfortable, well-nourished, safe, free from unpleasant states such as pain, fear, and distress, and able to express behaviours that are important for their physical and mental state. This includes meat products from animals that are raised in conditions that meet the criteria for good feeding, housing, health, and optimised emotional states, as defined by the world organisation for Animal Health (WOAH).

DESCRIPTION

This survey explores various dimensions, including purchase intentions, willingness to pay, attitudes towards animal welfare and environmental impacts, trust in certifications, perceived behavioural control, subjective norms, and personal values. By capturing a wide range of opinions and attitudes, the study seeks to inform future policies and practices in the meat production industry, ensuring that they align with consumer expectations and contribute to the broader goal of animal welfare improvement. The present survey is intended for participants following an omnivorous diet or a diet that does not exclude meat products.

RISKS

There is no risk associated with this study.

Consent Form

PARTICIPANT'S RIGHTS

If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. You have the right to refuse to answer particular questions. Your individual privacy will be maintained in all published and written data resulting from the study.

CONTACT INFORMATION

If you have any questions concerning this privacy policy or our data collection practices you may contact us at atsakas@white-research.eu. We reserve the right to change this privacy policy at any time and inform all participants about the updates.

In addition to your opinion, we are collecting some personal information such as Age, Gender, Area of residence, educational status and Net Annual Household Income for socio-demographic purposes. The collected data will be saved and used until the end of the research period of the aWISH project (31/10/2026). The data will be only used for the purpose of the aWISH project, funded under the European Union Horizon Europe programme (Grant Agreement No. 101060818).

The lawfulness of the processing of personal data is determined pursuant to Article 6 of the EU's General Data Protection Regulation (GDPR). With respect to personal data, the processing of personal data is based on consent. White Research will be responsible for accessing and processing the data.

1. If you have read the information above and would like to participate in the study, please click "I consent". Alternatively, if you do not want to complete the study, please click "I do not consent" and you will be redirected to the end of the study.

☐ I consent.
☐ I do not consent.

2. which of the following best describes your typical diet? choose the closest match, even if it's not a perfect fit.

○ **Omnivore** - No specific dietary restrictions; consumes meat, dairy, grains, fruits, and vegetables.

○ **Vegetarian** - Does not eat meat (including fish), but may consume dairy products and eggs.

○ **Vegan** - Does not consume any animal products, including dairy, eggs, and honey.

○ **Pescatarian** - Does not eat meat except for fish and seafood; may consume dairy products and eggs.

○ I prefer not to say.

○ Other (please specify)

_____

3. what is your Prolific unique ID?

_____

4. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I am planning to buy animal welfare-friendly meat products in the future.	○	○	○	○	○
The next time that I will do my shopping, I will buy animal welfare-friendly meat products.	○	○	○	○	○
I am planning to consciously buy animal welfare-friendly meat products instead of products that are not.	○	○	○	○	○

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5. Please indicate the extra percentage that you would be willing to pay for animal welfare-friendly meat products:

	0%	1-5%	6-10%	11-15%	16-20%	More than 20%
I would be willing to pay this extra percentage on products to support the organization's/product efforts to be animal welfare-friendly.	○	○	○	○	○	○

6. Please indicate your level of agreement with the following statement:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I am willing to pay for and buy animal welfare-friendly meat products even if a cheaper and less friendly meat product is next to it in the supermarket.	○	○	○	○	○

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7. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I think that it is good to buy animal welfare-friendly meat products.	○	○	○	○	○
I believe that consuming animal welfare-friendly meat products has a positive impact on the environment.	○	○	○	○	○
I believe that consuming animal welfare-friendly meat products has a positive contribution to animal welfare.	○	○	○	○	○

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8. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I think the quality of meat products with an animal welfare label is better guaranteed.	○	○	○	○	○
I think the traceability of meat products with an animal welfare label can find the accountable unit for substandard meat.	○	○	○	○	○
I think if a farm provides meat products with an animal welfare label, it means it is committed to continuously improving its business and production.	○	○	○	○	○

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9. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I can take the decision independently to buy animal welfare-friendly meat products.	○	○	○	○	○
I have the financial capability to buy animal welfare-friendly meat products.	○	○	○	○	○
I have the time to go for buying animal welfare-friendly meat products.	○	○	○	○	○
I have complete information and awareness regarding where to buy animal welfare-friendly meat products.	○	○	○	○	○
Animal welfare-friendly meat products are readily available in the location where I reside.	○	○	○	○	○
I can handle any (money, time, information related) difficulties associated with my buying decision.	○	○	○	○	○

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10. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
The trend of buying animal welfare-friendly meat products among people around me is increasing.	○	○	○	○	○
People around me generally believe that it is better for health to use animal welfare-friendly meat products.	○	○	○	○	○
My close friends and family members would appreciate if I bought animal welfare-friendly meat products.	○	○	○	○	○
I would get all the required support (money, time, information related) from friends and family to buy animal welfare-friendly meat products.	○	○	○	○	○

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11. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
Buying animal welfare-friendly meat products will indirectly decrease the stress level of production animals.	○	○	○	○	○
It is a problem that people do not buy animal welfare-friendly meat products.	○	○	○	○	○
The welfare of production animals will improve if we buy more animal welfare-friendly meat products.	○	○	○	○	○
Low animal welfare is a problem for society.	○	○	○	○	○

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12. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
Humans are severely abusing the environment.	○	○	○	○	○
Despite our special abilities, humans are still subject to the laws of nature.	○	○	○	○	○
The Earth is like a spaceship with very limited room and resources.	○	○	○	○	○
The balance of nature is very delicate and easily upset.	○	○	○	○	○
Plants and animals have as much right as humans to exist.	○	○	○	○	○
If things continue their present course, we will soon experience a major ecological catastrophe.	○	○	○	○	○

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13. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I am jointly responsible for animal welfare problems.	○	○	○	○	○
I feel jointly responsible for the animal welfare problems of production animals.	○	○	○	○	○
I feel jointly responsible for the increased stress level of production animals before they get slaughtered.	○	○	○	○	○
My contribution to animal welfare problems is negligible.	○	○	○	○	○
Not only the government and food industry are responsible for high non-animal welfare-friendly meat consumption, but me too.	○	○	○	○	○
In principle, individuals at their own cannot contribute to an increase of animal welfare.	○	○	○	○	○

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14. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
I feel I should choose animal welfare-friendly products instead of conventional animal products for the sake of animal welfare.	○	○	○	○	○
I get a bad conscience if I choose conventional instead of animal welfare-friendly products.	○	○	○	○	○

15. Please indicate your level of agreement with the following statements:

	1 = Strongly Disagree	2	3	4	5 = Strongly Agree
It is important to me that every person has equal opportunities.	○	○	○	○	○
It is important to me that every person is treated justly.	○	○	○	○	○
It is important to me that there is no war or conflict.	○	○	○	○	○
It is important to me to take care of those who are worse off.	○	○	○	○	○
It is important to me to have control over others' actions.	○	○	○	○	○
It is important to have authority over others.	○	○	○	○	○
It is important to have money and possessions.	○	○	○	○	○
It is important to me to prevent environmental pollution.	○	○	○	○	○
It is important to me to respect nature.	○	○	○	○	○
It is important to me to be in unity with nature.	○	○	○	○	○

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16. Most modern theories of decision-making recognize the fact that decisions do not take place in a vacuum. Individual preferences and knowledge, along with situational variables, can greatly impact the decision process. In order to facilitate our research on decision-making we are interested in knowing certain factors about you, the decision-maker. Specifically, we are interested in whether you actually take the time to read the directions; if not, then some of our manipulations that rely on changes in the instructions will be ineffective. So, in order to demonstrate that you have read the instructions, from the list of sports items below, please select only soccer and no other sports. Thank you very much.

- [ ] Skiing
- [ ] Soccer
- [ ] Snowboarding
- [ ] Running
- [ ] Hockey
- [ ] Football
- [ ] Swimming
- [ ] Tennis
- [ ] Basketball

Background information

17.   Please name the country that you are currently living in.

18.   Please name the city/town/village that you are currently living in.

19.   Please indicate your age.

20. Please indicate your gender.

○ Male

○ Female

○ Non-binary

○ Other

○ Prefer not to say

21. Please indicate the highest level of education you have attained.

○ Did Not Complete

○ High School/GED

○ Some College

○ Bachelor's Degree

○ Master's Degree

○ Advanced Graduate work or Ph.D.

22. Please indicate your Net Annual Household Income (in Euros) now.

○ €5.000 or less

○ €5.001 - €15.000

○ €15.001 - €25.000

○ €25.001 - €35.000

○ €35.001 - €45.000

○ €45.001 - €55.000

○ €55.001 - €65.000

○ €65.001 - €75.000

○ €75.001 or more

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23. Please indicate your Net Annual Household Income (in Euros) when you were growing up.

○ €5.000 or less

○ €5.001 - €15.000

○ €15.001 - €25.000

○ €25.001 - €35.000

○ €35.001 - €45.000

○ €45.001 - €55.000

○ €55.001 - €65.000

○ €65.001 - €75.000

○ €75.001 or more

7.4. Topic Modelling Results

In this section, we present the results of the topic modelling analysis conducted on the interview responses. For readers to easily follow the analysis, the "topic coherence" graph is provided to help determine the optimal number of topics. The coherence score measures the degree of semantic similarity between the words in a topic, with higher coherence scores generally indicating more interpretable and meaningful topics.

As discussed above, each topic generated by the LDA is represented as a distribution of words, which allows for the identification of prominent themes and patterns within the responses. In the "Identified topics" subsection, each topic is presented with a set of words, each paired with a number. This number represents the weight or importance of the word within that topic, indicating how strongly that word is associated with the topic.

Question 1: What are the factors, in your opinion, that facilitate or hinder the adoption of welfare-friendly approaches?

Topic Coherence

Optimal Number of Topics: 19
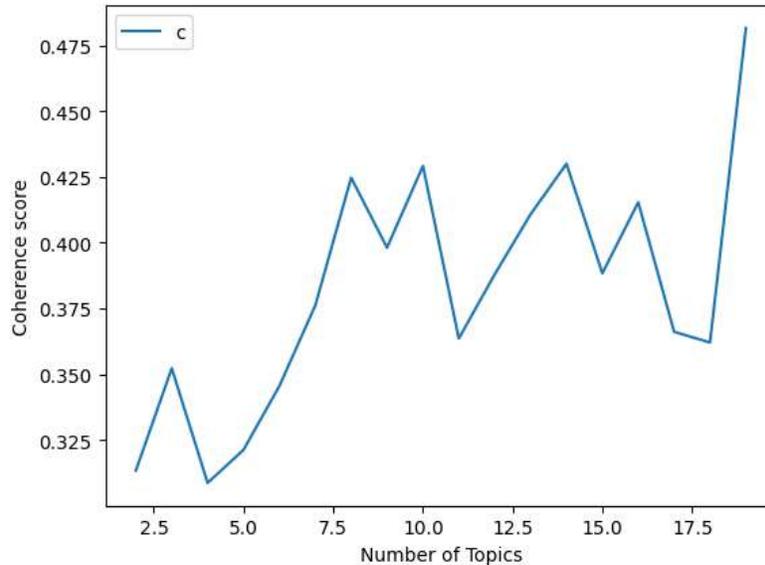
Identified topics

(0, '0.013*"level" + 0.013*"awareness" + 0.013*"action" + 0.013*"control" + 0.013*"daily" + 0.013*"education" + 0.013*"lack" + 0.013*"low" + 0.013*"people" + 0.013*"well"')

(1, '0.033*"animal" + 0.026*"tool" + 0.020*"welfare" + 0.020*"factor" + 0.013*"time" + 0.013*"farmer" + 0.013*"assessment" + 0.013*"ass" + 0.013*"continuous" + 0.013*"tail"')

(2, '0.052*"animal" + 0.030*"welfare" + 0.019*"welfarefriendly" + 0.015*"need" + 0.015*"often" + 0.015*"sector" + 0.015*"also" + 0.011*"husbandry" + 0.011*"chain" + 0.011*"system"')

(3, '0.038*"animal" + 0.021*"production" + 0.012*"danish" + 0.012*"product" + 0.012*"meat" + 0.009*"political" + 0.009*"food" + 0.009*"efficiency" + 0.009*"milk" + 0.009*"welfare"')

(4, '0.001*"crucial" + 0.001*"consider" + 0.001*"responsible" + 0.001*"recognize" + 0.001*"person" + 0.001*"making" + 0.001*"living" + 0.001*"implementing" + 0.001*"finally" + 0.001*"whoever"')

(5, '0.026*"welfarefriendly" + 0.026*"approach" + 0.024*"also" + 0.024*"farmer" + 0.024*"animal" + 0.016*"change" + 0.015*"need" + 0.015*"system" + 0.012*"initiative" + 0.011*"sometimes"')

(6, '0.043*"animal" + 0.020*"welfare" + 0.014*"approach" + 0.013*"production" + 0.012*"consumer" + 0.012*"cost" + 0.009*"factor" + 0.009*"selection" + 0.009*"also" + 0.009*"problem"')

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(7, '0.035*"animal" + 0.028*"farm" + 0.021*"welfare" + 0.021*"slaughterhouse" + 0.017*"control" + 0.014*"pig" + 0.014*"often" + 0.014*"farmer" + 0.011*"limitation" + 0.011*"arise"')

(8, '0.025*"slaughterhouse" + 0.015*"example" + 0.015*"people" + 0.015*"stage" + 0.015*"welfare" + 0.015*"space" + 0.015*"animal" + 0.010*"different" + 0.010*"time" + 0.010*"factor"')

(9, '0.001*"animal" + 0.001*"welfare" + 0.001*"farm" + 0.001*"pig" + 0.001*"farmer" + 0.001*"control" + 0.001*"slaughterhouse" + 0.001*"limitation" + 0.001*"one" + 0.001*"least"')

(10, '0.054*"animal" + 0.042*"welfare" + 0.025*"practice" + 0.023*"adoption" + 0.017*"regulation" + 0.015*"factor" + 0.011*"issue" + 0.011*"hinder" + 0.010*"also" + 0.010*"consumer"')

(11, '0.037*"welfare" + 0.030*"animal" + 0.010*"slaughterhouse" + 0.010*"quality" + 0.010*"another" + 0.010*"also" + 0.010*"farm" + 0.008*"department" + 0.008*"measure" + 0.008*"important"')

(12, '0.024*"animal" + 0.017*"slaughterhouse" + 0.014*"welfare" + 0.012*"may" + 0.012*"pig" + 0.012*"factor" + 0.010*"etc" + 0.010*"staff" + 0.010*"important" + 0.010*"consumer"')

(13, '0.041*"welfare" + 0.030*"animal" + 0.016*"factor" + 0.012*"producer" + 0.012*"product" + 0.009*"adoption" + 0.009*"dont" + 0.009*"market" + 0.009*"training" + 0.009*"lack"')

(14, '0.027*"better" + 0.018*"welfare" + 0.009*"listed" + 0.009*"physical" + 0.009*"limit" + 0.009*"lesion" + 0.009*"problem" + 0.009*"possibility" + 0.009*"influence" + 0.009*"point"')

(15, '0.030*"animal" + 0.023*"welfare" + 0.014*"knowledge" + 0.014*"training" + 0.013*"factor" + 0.011*"facility" + 0.011*"production" + 0.011*"case" + 0.010*"example" + 0.010*"economic"')

(16, '0.030*"practice" + 0.025*"factor" + 0.020*"farm" + 0.015*"people" + 0.015*"economic" + 0.010*"supportive" + 0.010*"wellbeingfriendly" + 0.010*"challenge" + 0.010*"wellbeing" + 0.010*"may"')

(17, '0.001*"public" + 0.001*"demand" + 0.001*"way" + 0.001*"animal" + 0.001*"improve" + 0.001*"system" + 0.001*"producer" + 0.001*"welfare" + 0.001*"think" + 0.001*"product"')

(18, '0.026*"approach" + 0.026*"influence" + 0.026*"welfarefriendly" + 0.017*"higher" + 0.017*"certain" + 0.017*"public" + 0.017*"buy" + 0.017*"producer" + 0.017*"retail" + 0.017*"price"')
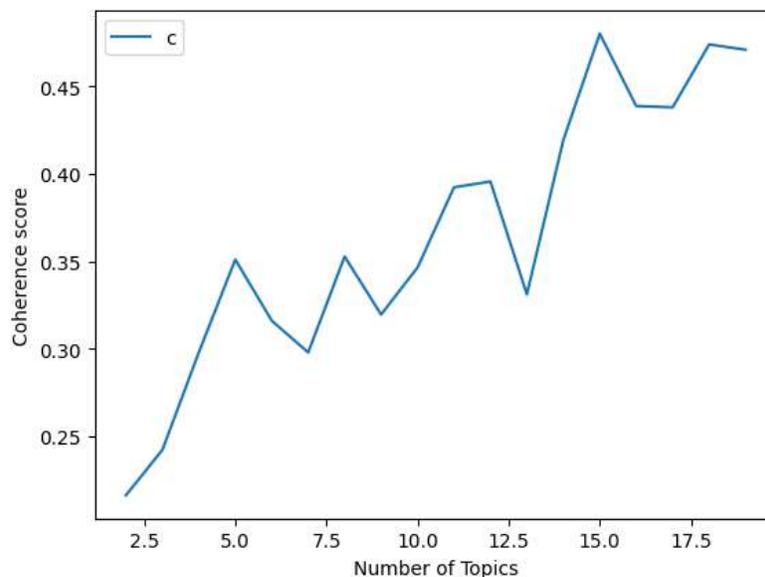
question 2: what obstacles and opportunities do you perceive in adopting welfare-friendly approaches in relation to yourself or other stakeholders?

Topic coherence

Optimal number of topics: 15

Identified topics

(0, '0.021*"animal" + 0.017*"welfare" + 0.013*"certification" + 0.013*"product" + 0.013*"production" + 0.011*"consumer" + 0.009*"change" + 0.009*"market" + 0.009*"value" + 0.009*"year"')

(1, '0.039*"action" + 0.013*"one" + 0.013*"transporter" + 0.013*"authority" + 0.013*"opportunity" + 0.013*"improvement" + 0.013*"taking" + 0.007*"welfare" + 0.007*"camera" + 0.007*"control"')

(2, '0.035*"animal" + 0.024*"welfare" + 0.013*"society" + 0.011*"farmer" + 0.011*"find" + 0.011*"lack" + 0.011*"obstacle" + 0.009*"message" + 0.009*"indicator" + 0.007*"meat"')

(3, '0.043*"animal" + 0.022*"slaughterhouse" + 0.014*"welfare" + 0.013*"production" + 0.011*"large" + 0.011*"transport" + 0.011*"pig" + 0.011*"farm" + 0.010*"higher" + 0.007*"way"')

(4, '0.034*"welfare" + 0.032*"animal" + 0.017*"opportunity" + 0.012*"make" + 0.012*"obstacle" + 0.012*"approach" + 0.010*"system" + 0.010*"also" + 0.010*"need" + 0.008*"would"')

(5, '0.041*"animal" + 0.025*"welfare" + 0.016*"need" + 0.016*"farm" + 0.012*"pig" + 0.010*"sector" + 0.008*"regarding" + 0.008*"decree" + 0.008*"regulation" + 0.008*"one"')

(6, '0.031*"money" + 0.024*"animal" + 0.021*"high" + 0.021*"make" + 0.017*"welfare" + 0.014*"factor" + 0.014*"well" + 0.014*"external" + 0.014*"company" + 0.014*"meat"')

(7, '0.023*"meat" + 0.019*"animal" + 0.012*"opportunity" + 0.012*"however" + 0.012*"le" + 0.012*"farmer" + 0.012*"welfare" + 0.012*"important" + 0.008*"consumer" + 0.008*"cheap"')

(8, '0.031*"welfarefriendly" + 0.020*"opportunity" + 0.017*"approach" + 0.017*"stakeholder" + 0.017*"may" + 0.017*"better" + 0.016*"obstacle" + 0.014*"cost" + 0.014*"practice" + 0.014*"consumer"')

(9, '0.046*"animal" + 0.038*"welfare" + 0.020*"legislation" + 0.012*"agricultural" + 0.012*"production" + 0.010*"system" + 0.010*"better" + 0.010*"label" + 0.010*"organization" + 0.009*"sector"')

(10, '0.031*"see" + 0.016*"opportunity" + 0.016*"disease" + 0.016*"system" + 0.016*"prevention" + 0.016*"rather" + 0.016*"obstacle" + 0.016*"right" + 0.008*"focus" + 0.008*"dont"')

(11, '0.021*"pig" + 0.021*"regulation" + 0.021*"chain" + 0.021*"need" + 0.014*"opportunity" + 0.014*"play" + 0.014*"practice" + 0.007*"may" + 0.007*"might" + 0.007*"natural"')

(12, '0.025*"consumer" + 0.009*"relation" + 0.009*"global" + 0.009*"ignorance" + 0.009*"inflationary" + 0.009*"noneuropean" + 0.009*"opportunity" + 0.009*"schizophrenia" + 0.009*"responsibility" + 0.009*"doesnt"')

(13, '0.022*"animal" + 0.018*"obstacle" + 0.013*"welfare" + 0.013*"country" + 0.009*"opportunity" + 0.009*"dead" + 0.009*"sector" + 0.009*"truck" + 0.009*"transport" + 0.009*"staff"')

(14, '0.023*"sector" + 0.019*"animal" + 0.016*"welfare" + 0.015*"opportunity" + 0.012*"chain" + 0.012*"direction" + 0.012*"pork" + 0.010*"production" + 0.009*"believe" + 0.009*"thing"')
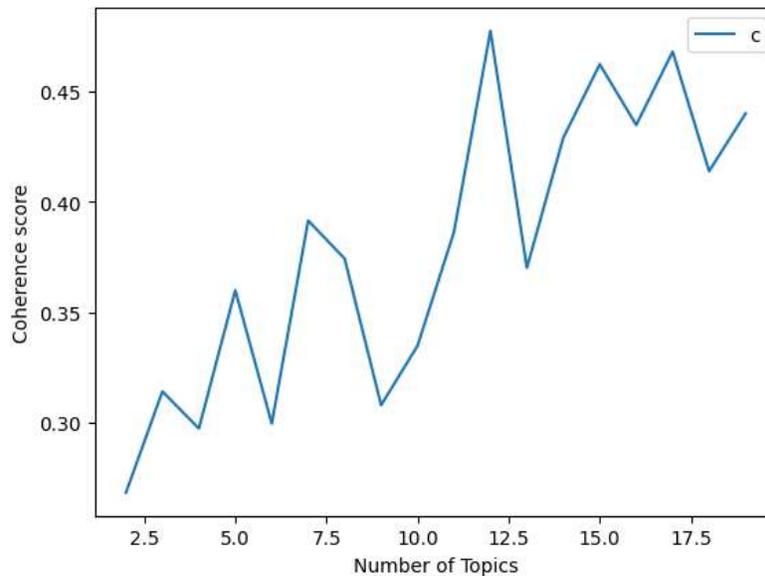
question 3: can you describe, from your experience, what a good life means for a farm animal?

Topic coherence

optimal number of topics: 12

Identified topics

(0, '0.031*"animal" + 0.019*"farm" + 0.019*"sheep" + 0.019*"field" + 0.013*"condition" + 0.013*"factor" + 0.013*"lot" + 0.013*"thats" + 0.013*"example" + 0.013*"human"')

(1, '0.070*"animal" + 0.023*"emotion" + 0.017*"need" + 0.017*"good" + 0.016*"positive" + 0.013*"life" + 0.011*"specie" + 0.009*"much" + 0.009*"ngo" + 0.009*"suffering"')

(2, '0.015*"factor" + 0.015*"condition" + 0.015*"pig" + 0.015*"ensure" + 0.015*"important" + 0.015*"illness" + 0.015*"life" + 0.015*"good" + 0.008*"throughout" + 0.008*"question"')

(3, '0.020*"behaviour" + 0.020*"positive" + 0.020*"hand" + 0.010*"ability" + 0.010*"question" + 0.010*"ensuring" + 0.010*"five" + 0.010*"basic" + 0.010*"reinforcement" + 0.010*"minimum"')

(4, '0.046*"good" + 0.035*"need" + 0.027*"life" + 0.019*"animal" + 0.016*"pig" + 0.012*"must" + 0.012*"one" + 0.012*"production" + 0.012*"criterion" + 0.012*"anthropomorphic"')

(5, '0.045*"animal" + 0.027*"life" + 0.021*"natural" + 0.019*"farm" + 0.019*"good" + 0.012*"live" + 0.011*"stress" + 0.010*"behaviour" + 0.010*"like" + 0.010*"choice"')

(6, '0.058*"animal" + 0.022*"life" + 0.015*"experience" + 0.015*"good" + 0.014*"welfare" + 0.012*"need" + 0.011*"environment" + 0.010*"possible" + 0.009*"access" + 0.009*"also"')

(7, '0.068*"freedom" + 0.026*"animal" + 0.019*"behavior" + 0.017*"fear" + 0.014*"stress" + 0.013*"providing" + 0.013*"pain" + 0.013*"five" + 0.013*"disease" + 0.009*"must"')

(8, '0.020*"possibility" + 0.020*"risk" + 0.020*"low" + 0.011*"limited" + 0.011*"water" + 0.011*"access" + 0.011*"enough" + 0.011*"behaviour" + 0.011*"disease" + 0.011*"suitable"')

(9, '0.085*"animal" + 0.029*"good" + 0.027*"life" + 0.019*"natural" + 0.015*"experience" + 0.012*"farm" + 0.010*"environment" + 0.010*"need" + 0.008*"able" + 0.008*"care"')

(10, '0.035*"animal" + 0.021*"important" + 0.021*"humanely" + 0.014*"freedom" + 0.014*"thats" + 0.014*"grandparent" + 0.008*"able" + 0.008*"food" + 0.008*"five" + 0.008*"water"')

(11, '0.021*"natural" + 0.011*"well" + 0.011*"move" + 0.011*"condition" + 0.011*"freely" + 0.011*"space" + 0.011*"provided" + 0.011*"enough" + 0.011*"environment" + 0.011*"farmer"')
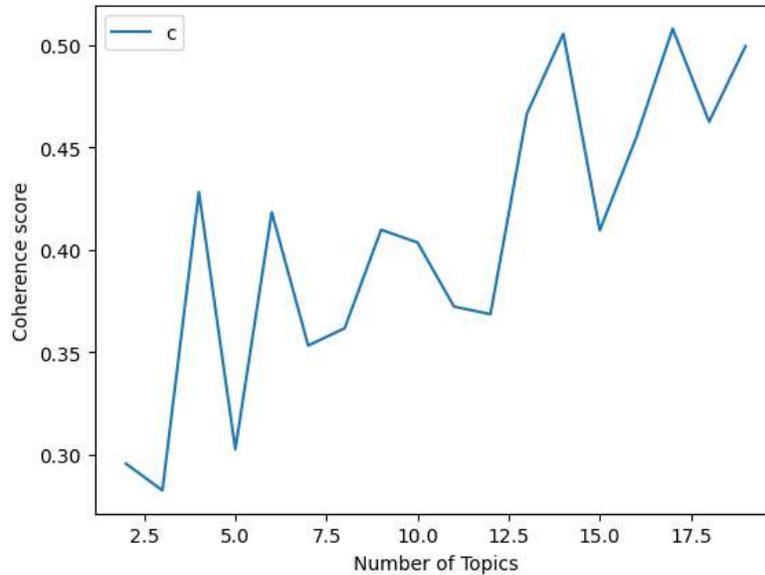
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question 4: what do you associate with positive animal welfare (regarding the five freedoms or the perspective or the interviewee)?

Topic coherence

optimal number of topics: 17

Identified topics

(0, '0.078*"animal" + 0.031*"five" + 0.024*"freedom" + 0.020*"absence" + 0.016*"negative" + 0.016*"positive" + 0.012*"state" + 0.012*"domain" + 0.012*"emotion" + 0.012*"life"')

(1, '0.032*"new" + 0.016*"positively" + 0.016*"good" + 0.016*"freedom" + 0.016*"stimulus" + 0.016*"experience" + 0.016*"occupied" + 0.016*"old" + 0.016*"school" + 0.016*"way"')

(2, '0.025*"natural" + 0.013*"changing" + 0.013*"distraction" + 0.013*"diet" + 0.013*"daynight" + 0.013*"apple" + 0.013*"biscuit" + 0.013*"example" + 0.013*"live" + 0.013*"structure"')

(3, '0.057*"freedom" + 0.017*"crucial" + 0.017*"time" + 0.017*"important" + 0.017*"handling" + 0.017*"farm" + 0.017*"toy" + 0.009*"challenging" + 0.009*"journey" + 0.009*"due"')

(4, '0.051*"freedom" + 0.031*"animal" + 0.021*"must" + 0.021*"without" + 0.021*"condition" + 0.021*"pain" + 0.011*"similar" + 0.011*"answer" + 0.011*"live" + 0.011*"best"')

(5, '0.001*"within" + 0.001*"vegan" + 0.001*"healthy" + 0.001*"ability" + 0.001*"worthwhile" + 0.001*"composition" + 0.001*"vegetarian" + 0.001*"result" + 0.001*"studying" + 0.001*"concept"')

(6, '0.057*"animal" + 0.040*"freedom" + 0.017*"need" + 0.017*"welfare" + 0.017*"positive" + 0.012*"fear" + 0.012*"pain" + 0.012*"involves" + 0.012*"disease" + 0.012*"negative"')

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(7, '0.001*"within" + 0.001*"vegan" + 0.001*"healthy" + 0.001*"ability" + 0.001*"worthwhile" + 0.001*"composition" + 0.001*"vegetarian" + 0.001*"result" + 0.001*"studying" + 0.001*"concept"')

(8, '0.029*"behaviour" + 0.020*"five" + 0.020*"welfare" + 0.020*"freedom" + 0.020*"criterion" + 0.020*"measuring" + 0.010*"thirst" + 0.010*"qualitative" + 0.010*"qba" + 0.010*"quality"')

(9, '0.029*"good" + 0.029*"animal" + 0.015*"obtained" + 0.015*"maintaining" + 0.015*"product" + 0.015*"security" + 0.015*"essence" + 0.015*"water" + 0.015*"said" + 0.015*"food"')

(10, '0.030*"animal" + 0.021*"slaughterhouse" + 0.020*"pig" + 0.020*"welfare" + 0.017*"farm" + 0.014*"behaviour" + 0.010*"live" + 0.010*"condition" + 0.010*"define" + 0.010*"good"')

(11, '0.001*"within" + 0.001*"vegan" + 0.001*"healthy" + 0.001*"ability" + 0.001*"worthwhile" + 0.001*"composition" + 0.001*"vegetarian" + 0.001*"result" + 0.001*"studying" + 0.001*"concept"')

(12, '0.059*"welfare" + 0.057*"animal" + 0.041*"positive" + 0.017*"freedom" + 0.016*"experience" + 0.016*"five" + 0.014*"negative" + 0.012*"research" + 0.009*"focus" + 0.009*"also"')

(13, '0.048*"animal" + 0.022*"must" + 0.022*"farm" + 0.015*"condition" + 0.015*"able" + 0.012*"positive" + 0.012*"welfare" + 0.011*"want" + 0.011*"specie" + 0.011*"possibility"')

(14, '0.087*"animal" + 0.029*"welfare" + 0.025*"natural" + 0.022*"freedom" + 0.016*"behaviour" + 0.015*"production" + 0.015*"way" + 0.013*"important" + 0.012*"environment" + 0.010*"express"')

(15, '0.022*"slaughterhouse" + 0.022*"welfare" + 0.022*"animal" + 0.022*"five" + 0.011*"deteriorate" + 0.011*"differ" + 0.011*"pillar" + 0.011*"control" + 0.011*"majority" + 0.011*"fecal"')

(16, '0.046*"animal" + 0.021*"welfare" + 0.016*"freedom" + 0.011*"people" + 0.011*"care" + 0.011*"possible" + 0.011*"ensuring" + 0.011*"many" + 0.011*"year" + 0.011*"aspect"')
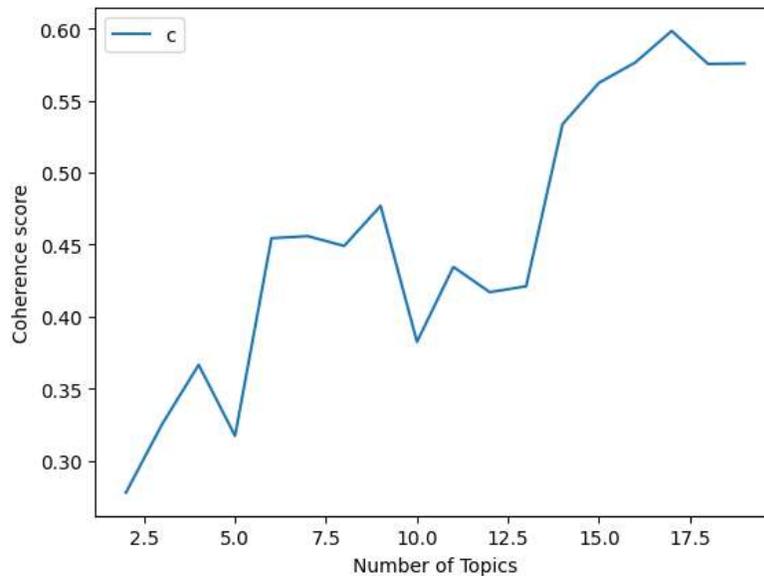
Question 5: Do you place a substantial amount of significance on animal welfare?

Topic coherence

Optimal number of topics: 17

Identified topics

(0, '0.056*"welfare" + 0.045*"animal" + 0.034*"way" + 0.023*"production" + 0.023*"human" + 0.023*"health" + 0.023*"one" + 0.012*"rule" + 0.012*"poultry" + 0.012*"producer"')

(1, '0.034*"make" + 0.018*"right" + 0.018*"want" + 0.018*"thing" + 0.018*"teach" + 0.018*"taking" + 0.018*"sure" + 0.018*"sadly" + 0.018*"see" + 0.018*"run"')

(2, '0.033*"many" + 0.033*"worker" + 0.033*"staff" + 0.017*"training" + 0.017*"animal" + 0.017*"welfare" + 0.017*"slaughterhouse" + 0.017*"see" + 0.017*"talk" + 0.017*"supervisor"')

(3, '0.025*"yes" + 0.025*"spread" + 0.025*"trying" + 0.025*"topic" + 0.025*"colleague" + 0.025*"issue" + 0.025*"becoming" + 0.025*"important" + 0.025*"awareness" + 0.001*"sector"')

(4, '0.025*"yes" + 0.025*"significant" + 0.025*"insignificant" + 0.025*"welfare" + 0.025*"assign" + 0.025*"scale" + 0.025*"topic" + 0.025*"animal" + 0.025*"would" + 0.001*"sector"')

(5, '0.066*"animal" + 0.040*"welfare" + 0.014*"place" + 0.014*"involved" + 0.014*"lie" + 0.014*"living" + 0.014*"policy" + 0.014*"public" + 0.014*"promote" + 0.014*"ethical"')

(6, '0.061*"animal" + 0.046*"also" + 0.031*"keep" + 0.031*"yes" + 0.016*"accept" + 0.016*"farming" + 0.016*"important" + 0.016*"livestock" + 0.016*"happy" + 0.016*"concerned"')

(7, '0.093*"welfare" + 0.068*"animal" + 0.043*"human" + 0.035*"important" + 0.018*"wellbeing" + 0.018*"expense" + 0.014*"yes" + 0.009*"fact" + 0.009*"farmercatching" + 0.009*"experiencing"')

(8, '0.076*"animal" + 0.023*"important" + 0.023*"welfare" + 0.015*"experience" + 0.015*"also" + 0.015*"life" + 0.015*"wellbeing" + 0.015*"performance" + 0.015*"related" + 0.015*"well"')

(9, '0.059*"animal" + 0.043*"welfare" + 0.026*"yes" + 0.017*"healthy" + 0.017*"important" + 0.017*"slaughterhouse" + 0.017*"pig" + 0.017*"condition" + 0.017*"however" + 0.017*"health"')

(10, '0.076*"welfare" + 0.071*"animal" + 0.020*"think" + 0.020*"yes" + 0.015*"important" + 0.015*"product" + 0.015*"quality" + 0.010*"aspect" + 0.010*"adequate" + 0.010*"well"')

(11, '0.085*"animal" + 0.059*"welfare" + 0.027*"also" + 0.013*"production" + 0.013*"important" + 0.013*"sector" + 0.013*"product" + 0.013*"quality" + 0.013*"better" + 0.013*"pressure"')

(12, '0.063*"animal" + 0.038*"welfare" + 0.032*"meat" + 0.019*"consume" + 0.013*"science" + 0.013*"scientific" + 0.013*"like" + 0.013*"consider" + 0.013*"product" + 0.013*"others"')

(13, '0.084*"yes" + 0.056*"animal" + 0.042*"welfare" + 0.042*"course" + 0.029*"keep" + 0.015*"home" + 0.015*"highest" + 0.015*"standard" + 0.015*"companion" + 0.015*"however"')

(14, '0.052*"animal" + 0.037*"yes" + 0.026*"welfare" + 0.026*"society" + 0.026*"low" + 0.026*"accepted" + 0.026*"practice" + 0.017*"factory" + 0.017*"consideration" + 0.017*"majority"')

(15, '0.039*"welfare" + 0.039*"yes" + 0.033*"animal" + 0.026*"important" + 0.013*"state" + 0.013*"using" + 0.013*"indicator" + 0.013*"farmer" + 0.013*"company" + 0.013*"something"')

(16, '0.002*"advocating" + 0.002*"around" + 0.002*"reason" + 0.002*"sector" + 0.002*"tends" + 0.002*"two" + 0.002*"advocate" + 0.002*"perspective" + 0.002*"arises" + 0.002*"code"')
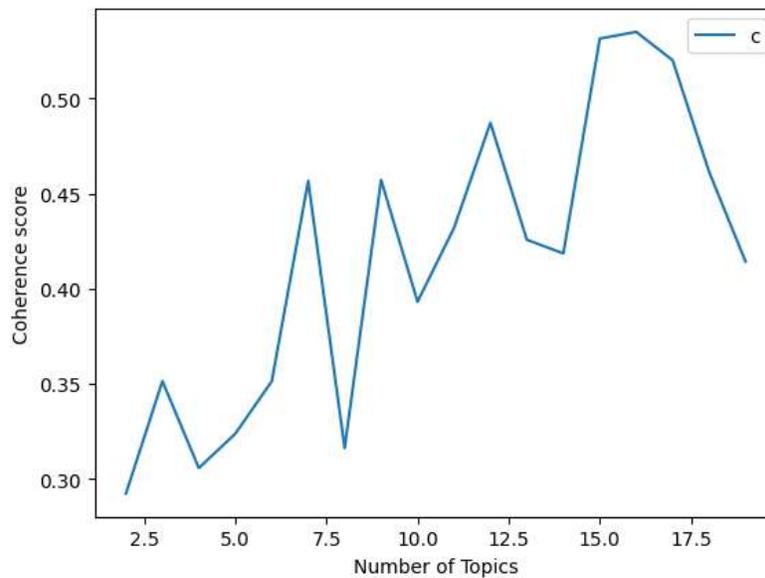
Question 6: Is there anything you want to change regarding animal living conditions from farm up to the slaughterhouse?

Topic coherence

Optimal number of topics: 16

Identified topics

(0, '0.031*"animal" + 0.023*"awareness" + 0.016*"stockmanship" + 0.016*"start" + 0.008*"stakeholder" + 0.008*"bigger" + 0.008*"welfare" + 0.008*"belong" + 0.008*"deal" + 0.008*"aligned"')

(1, '0.022*"broiler" + 0.017*"transport" + 0.017*"also" + 0.017*"growing" + 0.011*"get" + 0.011*"would" + 0.011*"good" + 0.011*"natural" + 0.011*"crate" + 0.011*"although"')

(2, '0.053*"animal" + 0.017*"would" + 0.017*"system" + 0.013*"welfare" + 0.013*"change" + 0.011*"slaughterhouse" + 0.010*"transport" + 0.010*"many" + 0.009*"farm" + 0.009*"meat"')

(3, '0.025*"animal" + 0.017*"production" + 0.017*"place" + 0.017*"concentration" + 0.017*"one" + 0.017*"big" + 0.009*"broiler" + 0.009*"way" + 0.009*"urgent" + 0.009*"also"')

(4, '0.001*"loaded" + 0.001*"lack" + 0.001*"point" + 0.001*"objectively" + 0.001*"moved" + 0.001*"minimize" + 0.001*"majority" + 0.001*"proper" + 0.001*"lameness" + 0.001*"greater"')

(5, '0.028*"animal" + 0.025*"access" + 0.025*"food" + 0.021*"feed" + 0.018*"area" + 0.018*"need" + 0.014*"report" + 0.014*"specie" + 0.011*"natural" + 0.011*"behaviour"')

(6, '0.014*"condition" + 0.014*"personnel" + 0.014*"transportation" + 0.014*"pig" + 0.014*"essential" + 0.014*"crucial" + 0.014*"farm" + 0.014*"way" + 0.014*"work" + 0.014*"among"')

(7, '0.041*"animal" + 0.029*"welfare" + 0.019*"husbandry" + 0.016*"change" + 0.015*"system" + 0.014*"factor" + 0.014*"environment" + 0.010*"breeding" + 0.010*"transition" + 0.010*"mean"')

(8, '0.022*"process" + 0.017*"wish" + 0.017*"transportation" + 0.011*"procedure" + 0.011*"better" + 0.011*"framework" + 0.011*"farmer" + 0.011*"legal" + 0.011*"injury" + 0.011*"slaughterhouse"')

(9, '0.047*"animal" + 0.020*"slaughterhouse" + 0.019*"condition" + 0.013*"slaughter" + 0.012*"farm" + 0.010*"think" + 0.010*"even" + 0.010*"cruel" + 0.010*"improvement" + 0.010*"fast"')

(10, '0.041*"animal" + 0.019*"farmer" + 0.018*"crate" + 0.015*"sow" + 0.015*"day" + 0.014*"transport" + 0.013*"need" + 0.013*"slaughterhouse" + 0.012*"make" + 0.012*"transportation"')

(11, '0.029*"animal" + 0.024*"would" + 0.019*"farm" + 0.019*"welfare" + 0.019*"training" + 0.014*"also" + 0.014*"change" + 0.014*"moment" + 0.010*"believe" + 0.010*"undergo"')

(12, '0.028*"animal" + 0.022*"transport" + 0.019*"condition" + 0.016*"slaughterhouse" + 0.013*"pig" + 0.013*"need" + 0.013*"time" + 0.010*"loaded" + 0.010*"suffering" + 0.010*"farm"')

(13, '0.031*"chicken" + 0.024*"breed" + 0.023*"growing" + 0.016*"commitment" + 0.016*"european" + 0.016*"ecc" + 0.016*"requirement" + 0.015*"welfare" + 0.014*"would" + 0.008*"employee"')

(14, '0.047*"animal" + 0.016*"lot" + 0.015*"farm" + 0.014*"system" + 0.014*"livestock" + 0.011*"mutilation" + 0.011*"pain" + 0.011*"transport" + 0.010*"condition" + 0.010*"also"')

(15, '0.035*"animal" + 0.025*"pig" + 0.023*"stunning" + 0.017*"slaughter" + 0.013*"specie" + 0.012*"transport" + 0.010*"current" + 0.010*"breeding" + 0.009*"poultry" + 0.008*"life"')

Question 7: Are you well informed about animal-friendly production practices?

Topic coherence

Optimal number of topics: 17
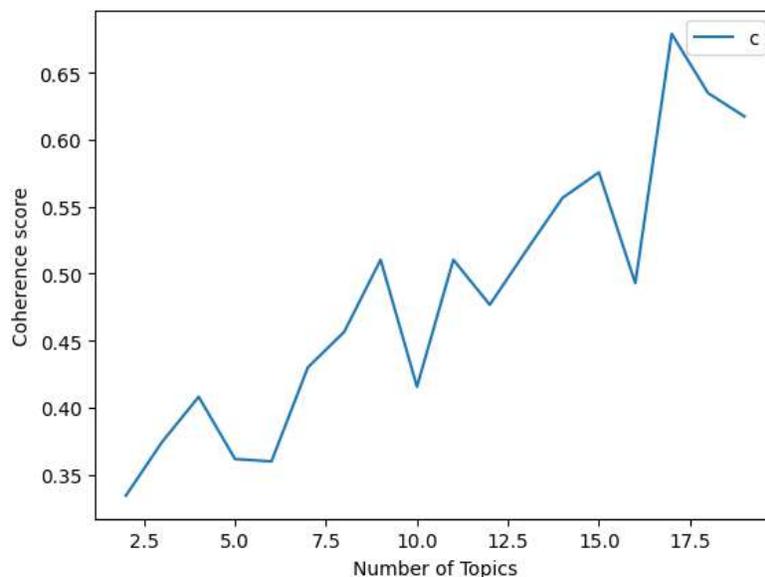
Identified topics

(0, '0.044*"yes" + 0.033*"job" + 0.022*"management" + 0.022*"pen" + 0.022*"consumer" + 0.022*"example" + 0.022*"part" + 0.011*"gestation" + 0.011*"lairage" + 0.011*"freefarrowing"')

(1, '0.077*"regulation" + 0.020*"underlying" + 0.020*"people" + 0.020*"state" + 0.020*"spirit" + 0.020*"sometimes" + 0.020*"understanding" + 0.020*"legal" + 0.020*"may" + 0.020*"without"')

(2, '0.024*"label" + 0.024*"consumer" + 0.012*"information" + 0.012*"little" + 0.012*"production" + 0.012*"standard" + 0.012*"leven" + 0.012*"inform" + 0.012*"supermarket" + 0.012*"organic"')

(3, '0.036*"others" + 0.036*"useful" + 0.036*"yes" + 0.002*"specie" + 0.002*"manipulable" + 0.002*"lot" + 0.002*"practical" + 0.002*"since" + 0.002*"generally" + 0.002*"material"')

(4, '0.057*"informed" + 0.057*"well" + 0.029*"knowledge" + 0.029*"always" + 0.029*"think" + 0.029*"room" + 0.029*"maybe" + 0.029*"could" + 0.002*"consumer" + 0.002*"manipulable"')

(5, '0.002*"since" + 0.002*"specie" + 0.002*"generally" + 0.002*"insight" + 0.002*"lot" + 0.002*"practical" + 0.002*"centre" + 0.002*"material" + 0.002*"dimension" + 0.002*"access"')

(6, '0.068*"animal" + 0.051*"welfare" + 0.023*"know" + 0.018*"scientific" + 0.012*"yes" + 0.012*"paw" + 0.012*"focus" + 0.012*"four" + 0.012*"farm" + 0.012*"scientist"')

(7, '0.032*"animal" + 0.022*"know" + 0.022*"consumer" + 0.022*"tell" + 0.011*"actually" + 0.011*"tactic" + 0.011*"take" + 0.011*"coding" + 0.011*"anything" + 0.011*"confusing"')

(8, '0.036*"understanding" + 0.036*"animalfriendly" + 0.036*"production" + 0.034*"practice" + 0.019*"participating" + 0.019*"ongoing" + 0.019*"scientific" + 0.019*"trend" + 0.019*"wellinformed" + 0.019*"industry"')

(9, '0.048*"animal" + 0.048*"practice" + 0.032*"new" + 0.032*"production" + 0.016*"know" + 0.016*"truly" + 0.016*"exploited" + 0.016*"extensive" + 0.016*"believe" + 0.016*"considered"')

(10, '0.060*"animal" + 0.048*"welfare" + 0.024*"yes" + 0.024*"country" + 0.024*"guaranteeing" + 0.024*"farmer" + 0.024*"field" + 0.024*"time" + 0.024*"ive" + 0.024*"fortunately"')

(11, '0.067*"animal" + 0.050*"yes" + 0.042*"slaughterhouse" + 0.034*"welfare" + 0.017*"believe" + 0.017*"much" + 0.017*"slaughter" + 0.017*"training" + 0.017*"degree" + 0.017*"need"')

(12, '0.058*"production" + 0.045*"level" + 0.044*"practice" + 0.030*"advancement" + 0.030*"wellinformed" + 0.030*"staying" + 0.030*"science" + 0.030*"industry" + 0.030*"collaboration" + 0.028*"animalfriendly"')

(13, '0.072*"yes" + 0.036*"practice" + 0.024*"production" + 0.024*"best" + 0.024*"work" + 0.013*"involved" + 0.013*"official" + 0.013*"office" + 0.013*"process" + 0.013*"cooperates"')

(14, '0.038*"animal" + 0.038*"welfare" + 0.026*"farming" + 0.026*"label" + 0.026*"organic" + 0.026*"scheme" + 0.026*"legislation" + 0.013*"present" + 0.013*"requirement" + 0.013*"practice"')

(15, '0.050*"work" + 0.050*"yes" + 0.038*"well" + 0.025*"animal" + 0.025*"access" + 0.025*"information" + 0.025*"know" + 0.025*"informed" + 0.025*"also" + 0.013*"insight"')

(16, '0.075*"practice" + 0.031*"knowledge" + 0.031*"animalfriendly" + 0.031*"well" + 0.031*"informed" + 0.031*"regarding" + 0.016*"role" + 0.016*"gained" + 0.016*"industry" + 0.016*"due"')

Question 8: What is your opinion regarding the monitoring of animal welfare?

Topic coherence

Optimal number of topics: 17
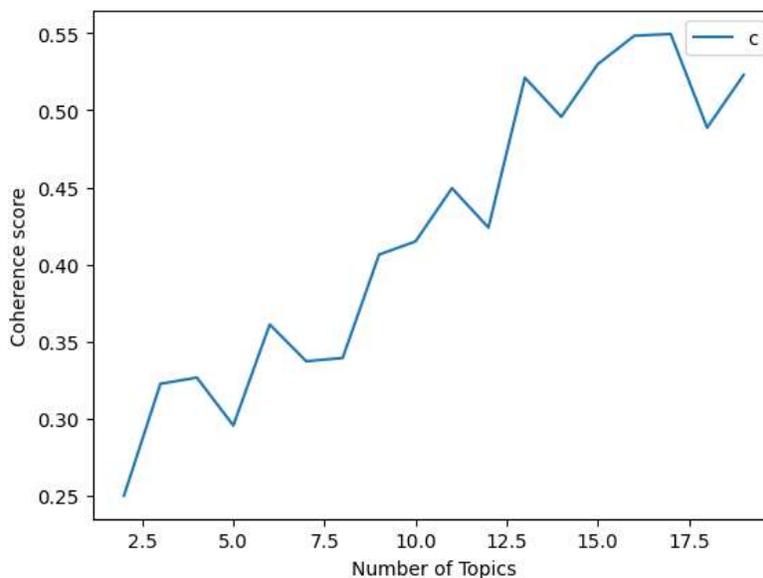
Identified topics

(0, '0.046*"animal" + 0.043*"welfare" + 0.037*"monitoring" + 0.016*"problem" + 0.012*"would" + 0.012*"assessment" + 0.012*"slaughter" + 0.012*"day" + 0.012*"help" + 0.012*"farming"')

(1, '0.027*"welfare" + 0.014*"regular" + 0.014*"compliance" + 0.014*"combination" + 0.014*"standard" + 0.014*"done" + 0.014*"believe" + 0.014*"monitoring" + 0.014*"advancement" + 0.014*"data"')

(2, '0.055*"control" + 0.033*"level" + 0.022*"already" + 0.022*"well" + 0.022*"carried" + 0.012*"harmonization" + 0.012*"make" + 0.012*"established" + 0.012*"easier" + 0.012*"operator"')

(3, '0.022*"salmonella" + 0.022*"animal" + 0.018*"issue" + 0.018*"farm" + 0.018*"part" + 0.018*"pay" + 0.018*"control" + 0.013*"law" + 0.013*"prevalence" + 0.013*"investment"')

(4, '0.033*"much" + 0.025*"looking" + 0.025*"farm" + 0.017*"lot" + 0.017*"thing" + 0.017*"system" + 0.009*"mean" + 0.009*"would" + 0.009*"however" + 0.009*"official"')

(5, '0.041*"welfare" + 0.025*"assessment" + 0.025*"animal" + 0.016*"farm" + 0.016*"would" + 0.012*"system" + 0.012*"level" + 0.012*"think" + 0.012*"animalbased" + 0.012*"indicator"')

(6, '0.024*"animal" + 0.024*"indicator" + 0.012*"measure" + 0.012*"biting" + 0.012*"sound" + 0.012*"prevent" + 0.012*"camera" + 0.012*"perfect" + 0.012*"life" + 0.012*"moment"')

(7, '0.048*"animal" + 0.037*"welfare" + 0.032*"monitoring" + 0.027*"farm" + 0.021*"specialized" + 0.021*"control" + 0.021*"slaughterhouse" + 0.016*"done" + 0.011*"surveillance" + 0.011*"assignment"')

(8, '0.046*"monitoring" + 0.035*"welfare" + 0.023*"animal" + 0.012*"improving" + 0.012*"certain" + 0.012*"clear" + 0.012*"impact" + 0.012*"improve" + 0.012*"done" + 0.012*"argument"')

(9, '0.044*"animal" + 0.040*"welfare" + 0.019*"inspection" + 0.012*"egg" + 0.012*"violation" + 0.009*"hen" + 0.009*"breeding" + 0.009*"laying" + 0.009*"always" + 0.009*"however"')

(10, '0.040*"also" + 0.026*"animal" + 0.026*"welfare" + 0.025*"emphasize" + 0.025*"development" + 0.013*"however" + 0.013*"improved" + 0.013*"positive" + 0.013*"observation" + 0.013*"monitor"')

(11, '0.043*"monitoring" + 0.035*"animal" + 0.035*"welfare" + 0.018*"simple" + 0.018*"indicator" + 0.018*"farm" + 0.018*"mortality" + 0.018*"involve" + 0.018*"crucial" + 0.018*"inspection"')

(12, '0.053*"animal" + 0.048*"monitoring" + 0.032*"transport" + 0.027*"farm" + 0.022*"welfare" + 0.022*"authority" + 0.016*"moment" + 0.016*"also" + 0.016*"camera" + 0.016*"however"')

(13, '0.051*"control" + 0.024*"farm" + 0.023*"welfare" + 0.022*"animal" + 0.017*"need" + 0.016*"farmer" + 0.015*"use" + 0.015*"used" + 0.015*"well" + 0.015*"already"')

(14, '0.059*"animal" + 0.046*"welfare" + 0.032*"monitoring" + 0.020*"measure" + 0.013*"different" + 0.013*"also" + 0.013*"need" + 0.010*"really" + 0.010*"system" + 0.010*"production"')

(15, '0.044*"animal" + 0.042*"monitoring" + 0.027*"welfare" + 0.023*"farm" + 0.012*"broiler" + 0.011*"farmer" + 0.009*"use" + 0.009*"indicator" + 0.009*"would" + 0.009*"regulation"')

(16, '0.043*"monitoring" + 0.034*"animal" + 0.026*"indicator" + 0.026*"welfare" + 0.017*"onfarm" + 0.009*"location" + 0.009*"lege" + 0.009*"one" + 0.009*"probably" + 0.009*"determine"')
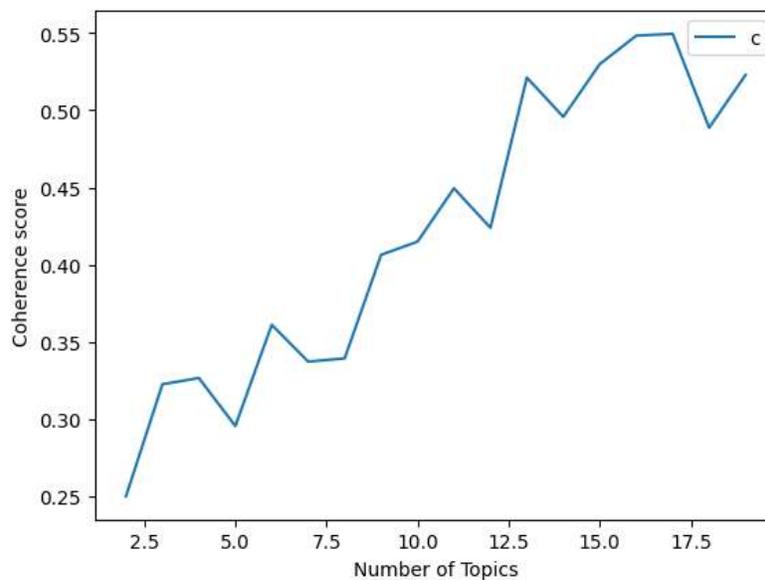

Question 9: Do you believe that consumers are willing to pay a premium price for higher welfare meat?

Topic coherence

Optimal Number of Topics: 17

Identified topics

(0, '0.039*"consumer" + 0.023*"egg" + 0.023*"would" + 0.016*"per" + 0.016*"meat" + 0.016*"welfare" + 0.016*"may" + 0.016*"pay" + 0.016*"information" + 0.008*"barn" +

0.008*"kipster" + 0.008*"overcharged" + 0.008*"increase" + 0.008*"paying" + 0.008*"recognize"')

(1, '0.057*"animal" + 0.045*"welfare" + 0.038*"consumer" + 0.026*"standard" + 0.014*"stricter" + 0.014*"danish" + 0.014*"organic" + 0.014*"citizen" + 0.013*"production" + 0.007*"relatively" + 0.007*"reintroduce" + 0.007*"rely" + 0.007*"according" + 0.007*"side" + 0.007*"accept"')

(2, '0.034*"people" + 0.027*"welfare" + 0.027*"animal" + 0.023*"expensive" + 0.023*"better" + 0.023*"lot" + 0.023*"power" + 0.023*"economic" + 0.019*"product" + 0.018*"pay" + 0.012*"yes" + 0.012*"willing" + 0.012*"think" + 0.012*"much" + 0.012*"certain"')

(3, '0.051*"meat" + 0.031*"would" + 0.031*"consumer" + 0.020*"welfare" + 0.020*"animal" + 0.017*"pay" + 0.017*"nonwelfare" + 0.014*"practice" + 0.014*"part" + 0.014*"willing" + 0.014*"product" + 0.014*"think" + 0.010*"condition" + 0.010*"also" + 0.010*"information"')

(4, '0.049*"welfare" + 0.040*"meat" + 0.036*"pay" + 0.032*"animal" + 0.028*"consumer" + 0.017*"willing" + 0.015*"price" + 0.013*"product" + 0.012*"people" + 0.009*"cheaper" + 0.009*"important" + 0.009*"may" + 0.009*"premium" + 0.008*"higher" + 0.007*"might"')

(5, '0.025*"product" + 0.013*"consider" + 0.013*"organic" + 0.013*"inflation" + 0.013*"high" + 0.013*"fighting" + 0.013*"choose" + 0.013*"cheaper" + 0.013*"difficult" + 0.013*"decide" + 0.013*"moment" + 0.013*"company" + 0.013*"people" + 0.013*"unfortunately" + 0.013*"well"')

(6, '0.001*"contrary" + 0.001*"country" + 0.001*"allocate" + 0.001*"attract" + 0.001*"attribute" + 0.001*"clearly" + 0.001*"communicate" + 0.001*"compliant" + 0.001*"confusing" + 0.001*"consuming" + 0.001*"accustomed" + 0.001*"cool" + 0.001*"entire" + 0.001*"european" + 0.001*"expense"')

(7, '0.032*"people" + 0.023*"product" + 0.023*"meat" + 0.022*"sold" + 0.022*"like" + 0.022*"le" + 0.017*"germany" + 0.017*"farm" + 0.017*"made" + 0.014*"higher" + 0.012*"welfare" + 0.011*"catalonia" + 0.011*"closed" + 0.011*"would" + 0.011*"effort"')

(8, '0.001*"contrary" + 0.001*"country" + 0.001*"allocate" + 0.001*"attract" + 0.001*"attribute" + 0.001*"clearly" + 0.001*"communicate" + 0.001*"compliant" + 0.001*"confusing" + 0.001*"consuming" + 0.001*"accustomed" + 0.001*"cool" + 0.001*"entire" + 0.001*"european" + 0.001*"expense"')

(9, '0.028*"people" + 0.027*"animal" + 0.023*"pay" + 0.023*"food" + 0.021*"label" + 0.020*"consumer" + 0.019*"product" + 0.018*"welfare" + 0.016*"willing" + 0.013*"meat" + 0.010*"society" + 0.010*"however" + 0.010*"must" + 0.010*"need" + 0.010*"one"')

(10, '0.030*"organic" + 0.030*"pork" + 0.020*"farm" + 0.020*"pay" + 0.020*"willing" + 0.020*"consumer" + 0.010*"got" + 0.010*"entail" + 0.010*"cost" + 0.010*"produce" + 0.010*"pig" + 0.010*"successful" + 0.010*"people" + 0.010*"certified" + 0.010*"even"')

(11, '0.001*"contrary" + 0.001*"country" + 0.001*"allocate" + 0.001*"attract" + 0.001*"attribute" + 0.001*"clearly" + 0.001*"communicate" + 0.001*"compliant" + 0.001*"confusing" + 0.001*"consuming" + 0.001*"accustomed" + 0.001*"cool" + 0.001*"entire" + 0.001*"european" + 0.001*"expense"')

(12, '0.038*"consumer" + 0.022*"practice" + 0.020*"animal" + 0.020*"welfare" + 0.019*"pay" + 0.016*"good" + 0.016*"want" + 0.011*"way" + 0.011*"support" + 0.011*"consider" + 0.011*"see" + 0.011*"tax" + 0.011*"may" + 0.011*"meat" + 0.011*"contribute"')

(13, '0.027*"animal" + 0.027*"welfare" + 0.027*"meat" + 0.018*"would" + 0.018*"consumer" + 0.018*"people" + 0.018*"product" + 0.009*"awareness" + 0.009*"often" + 0.009*"say" + 0.009*"want" + 0.009*"slaughterhouse" + 0.009*"majority" + 0.009*"next" + 0.009*"le"')

(14, '0.028*"must" + 0.028*"consumer" + 0.028*"product" + 0.028*"pay" + 0.019*"expensive" + 0.019*"major" + 0.019*"effect" + 0.019*"important" + 0.019*"animal" + 0.010*"cost" + 0.010*"health" + 0.010*"impact" + 0.010*"environmental" + 0.010*"human" + 0.010*"consume"')

(15, '0.048*"pay" + 0.026*"higher" + 0.026*"willing" + 0.025*"consumer" + 0.023*"welfare" + 0.022*"small" + 0.020*"product" + 0.018*"people" + 0.017*"price" + 0.013*"also" + 0.013*"often" + 0.013*"would" + 0.013*"topic" + 0.009*"cheapest" + 0.009*"group"')

Question 10: What is your overall opinion of the aWISH project?

Topic coherence

Optimal number of topics: 14
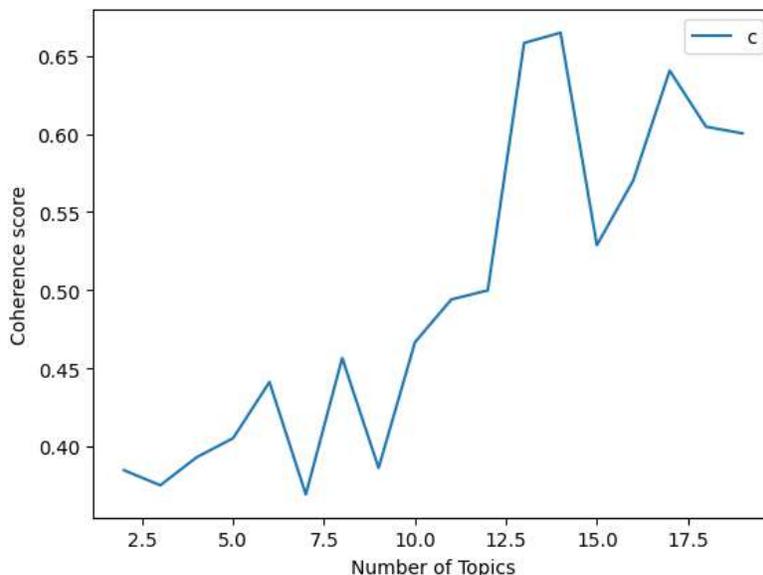
Identified topics

(0, '0.039*"project" + 0.025*"animal" + 0.017*"good" + 0.014*"production" + 0.011*"indicator" + 0.011*"damage" + 0.011*"important" + 0.011*"chain" + 0.008*"scored" + 0.008*"slaughterhouse"')

(1, '0.034*"animal" + 0.034*"project" + 0.027*"production" + 0.021*"good" + 0.021*"slaughterhouse" + 0.014*"important" + 0.014*"also" + 0.014*"find" + 0.014*"monitoring" + 0.014*"livestock"')

(2, '0.041*"project" + 0.034*"welfare" + 0.027*"especially" + 0.027*"good" + 0.027*"animal" + 0.021*"indicator" + 0.021*"monitoring" + 0.014*"result" + 0.014*"also" + 0.014*"practise"')

(3, '0.036*"think" + 0.022*"welfare" + 0.022*"animal" + 0.015*"big" + 0.015*"future" + 0.015*"valuable" + 0.015*"legal" + 0.015*"put" + 0.015*"also" + 0.015*"system"')

(4, '0.027*"many" + 0.027*"good" + 0.027*"difficult" + 0.027*"slaughterhouse" + 0.027*"project" + 0.014*"like" + 0.014*"farmer" + 0.014*"kind" + 0.014*"wish" + 0.014*"along"')

(5, '0.032*"information" + 0.032*"good" + 0.032*"reporting" + 0.021*"would" + 0.011*"awish" + 0.011*"node" + 0.011*"etc" + 0.011*"common" + 0.011*"pas" + 0.011*"happened"')

(6, '0.037*"animal" + 0.030*"project" + 0.026*"welfare" + 0.022*"technology" + 0.015*"way" + 0.011*"chain" + 0.011*"think" + 0.011*"based" + 0.011*"information" + 0.011*"production"')

(7, '0.033*"project" + 0.017*"find" + 0.017*"big" + 0.017*"interesting" + 0.017*"early" + 0.017*"transfer" + 0.017*"like" + 0.017*"expectation" + 0.017*"mind" + 0.017*"objective"')

(8, '0.028*"people" + 0.019*"outside" + 0.019*"counteract" + 0.019*"done" + 0.019*"know" + 0.019*"perception" + 0.019*"thing" + 0.019*"animal" + 0.010*"well" + 0.010*"help"')

(9, '0.061*"project" + 0.031*"slaughterhouse" + 0.031*"good" + 0.021*"must" + 0.021*"like" + 0.021*"new" + 0.021*"would" + 0.021*"includes" + 0.011*"indicator" + 0.011*"come"')

(10, '0.021*"value" + 0.021*"different" + 0.021*"data" + 0.021*"project" + 0.021*"result" + 0.021*"compare" + 0.011*"indicator" + 0.011*"see" + 0.011*"country" + 0.011*"interesting"')

(11, '0.041*"animal" + 0.021*"correct" + 0.011*"pain" + 0.011*"humane" + 0.011*"key" + 0.011*"man" + 0.011*"material" + 0.011*"necessary" + 0.011*"owner" + 0.011*"factor"')

(12, '0.036*"welfare" + 0.029*"assessment" + 0.022*"issue" + 0.022*"animal" + 0.022*"interesting" + 0.015*"project" + 0.015*"indicator" + 0.015*"current" + 0.015*"topic" + 0.008*"monitoring"')

(13, '0.041*"project" + 0.033*"animal" + 0.025*"welfare" + 0.017*"good" + 0.009*"among" + 0.009*"together" + 0.009*"farmer" + 0.009*"focus" + 0.009*"awareness" + 0.009*"useful"')

Question 11: Would you like to share any final thoughts? Anything you consider important to highlight?

Topic coherence

Optimal number of topics: 19
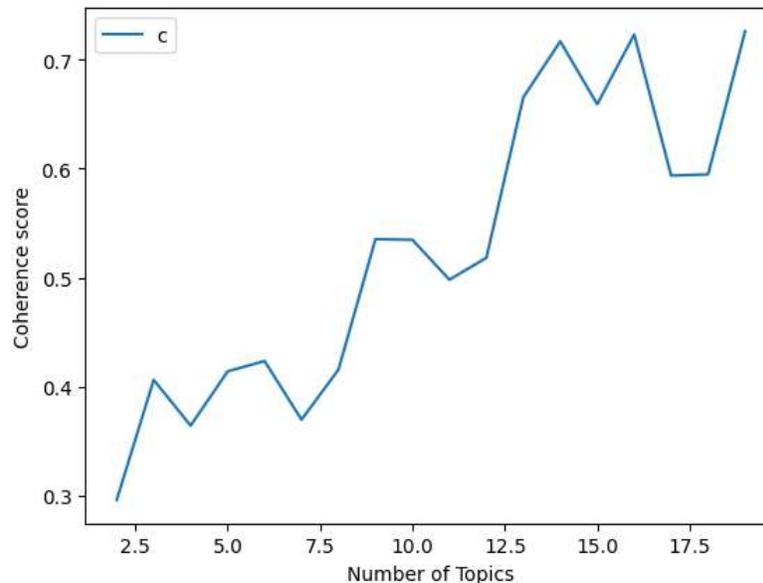
Identified topics

(0, '0.053*"data" + 0.027*"insight" + 0.014*"find" + 0.014*"collect" + 0.014*"bridge" + 0.014*"awish" + 0.014*"existing" + 0.014*"shared" + 0.014*"act" + 0.014*"maybe"')

(1, '0.044*"industry" + 0.030*"empathy" + 0.030*"culture" + 0.030*"responsibility" + 0.030*"improvement" + 0.030*"within" + 0.030*"future" + 0.030*"conclusion" + 0.030*"agriculture" + 0.030*"continuous"')

(2, '0.023*"animal" + 0.023*"many" + 0.023*"see" + 0.023*"farm" + 0.023*"complied" + 0.012*"average" + 0.012*"easier" + 0.012*"condition" + 0.012*"need" + 0.012*"competitiveness"')

(3, '0.021*"would" + 0.021*"good" + 0.021*"exists" + 0.021*"operator" + 0.021*"easier" + 0.021*"add" + 0.021*"make" + 0.021*"life" + 0.021*"application" + 0.021*"already"')

(4, '0.022*"animal" + 0.022*"farmer" + 0.015*"issue" + 0.015*"public" + 0.015*"transition" + 0.015*"must" + 0.015*"change" + 0.015*"make" + 0.015*"value" + 0.008*"stakeholder"')

(5, '0.040*"would" + 0.030*"animal" + 0.020*"welfare" + 0.020*"think" + 0.020*"slaughterhouse" + 0.020*"also" + 0.020*"teaching" + 0.020*"project" + 0.020*"good" + 0.020*"improvement"')

(6, '0.034*"welfare" + 0.023*"animal" + 0.023*"level" + 0.023*"need" + 0.023*"country" + 0.012*"union" + 0.012*"term" + 0.012*"greenwashing" + 0.012*"label" + 0.012*"labelling"')

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(7, '0.047*"welfare" + 0.040*"system" + 0.033*"extensive" + 0.027*"animal" + 0.020*"feeding" + 0.020*"intensive" + 0.014*"technology" + 0.014*"one" + 0.014*"however" + 0.014*"balance"')

(8, '0.026*"farm" + 0.026*"correct" + 0.026*"alternative" + 0.026*"also" + 0.026*"better" + 0.026*"listening" + 0.026*"easy" + 0.026*"choose" + 0.001*"becoming" + 0.001*"causing"')

(9, '0.002*"extensive" + 0.002*"animal" + 0.002*"intensive" + 0.002*"welfare" + 0.002*"system" + 0.002*"addressed" + 0.002*"accompanied" + 0.002*"awareness" + 0.002*"becoming" + 0.002*"end"')

(10, '0.043*"animal" + 0.026*"people" + 0.026*"product" + 0.026*"meat" + 0.026*"buy" + 0.017*"human" + 0.017*"welfare" + 0.017*"cheap" + 0.017*"expensive" + 0.017*"dont"')

(11, '0.054*"important" + 0.036*"part" + 0.019*"solution" + 0.019*"implementation" + 0.019*"supreme" + 0.019*"stakeholder" + 0.019*"scientific" + 0.019*"well" + 0.019*"involving" + 0.019*"dedicated"')

(12, '0.049*"animal" + 0.034*"production" + 0.026*"exist" + 0.026*"specie" + 0.026*"welfare" + 0.017*"purpose" + 0.017*"forget" + 0.017*"mustnt" + 0.017*"become" + 0.017*"product"')

(13, '0.002*"cage" + 0.002*"certification" + 0.002*"using" + 0.002*"accompanied" + 0.002*"addressed" + 0.002*"awareness" + 0.002*"based" + 0.002*"becoming" + 0.002*"towards" + 0.002*"causing"')

(14, '0.038*"method" + 0.038*"developed" + 0.038*"data" + 0.038*"gathering" + 0.038*"welfare" + 0.025*"animal" + 0.025*"project" + 0.013*"order" + 0.013*"practical" + 0.013*"use"')

(15, '0.025*"welfare" + 0.025*"animal" + 0.017*"tool" + 0.017*"production" + 0.017*"knowledge" + 0.017*"change" + 0.017*"legislation" + 0.017*"providing" + 0.017*"transfer" + 0.017*"result"')

(16, '0.047*"transport" + 0.024*"initiative" + 0.024*"also" + 0.024*"mixing" + 0.024*"pig" + 0.024*"animal" + 0.024*"already" + 0.024*"important" + 0.012*"involve" + 0.012*"instance"')

(17, '0.044*"market" + 0.029*"union" + 0.029*"cost" + 0.029*"european" + 0.029*"production" + 0.029*"protection" + 0.015*"europe" + 0.015*"never" + 0.015*"conquer" + 0.015*"highlight"')

(18, '0.036*"regulation" + 0.031*"farm" + 0.026*"animal" + 0.021*"make" + 0.016*"would" + 0.016*"welfare" + 0.016*"sow" + 0.016*"space" + 0.016*"many" + 0.016*"california"')

7.5. EU survey sample description

7.5.1. Participants' country distribution

Participants represented the majority of EU countries (Figure 8), ensuring a broad and diverse geographical distribution. This extensive representation enhances the reliability and generalizability of the survey findings, as it reflects a wide array of cultural, economic, and social backgrounds across the European Union.

Figure 8. Distribution of participants across EU countries
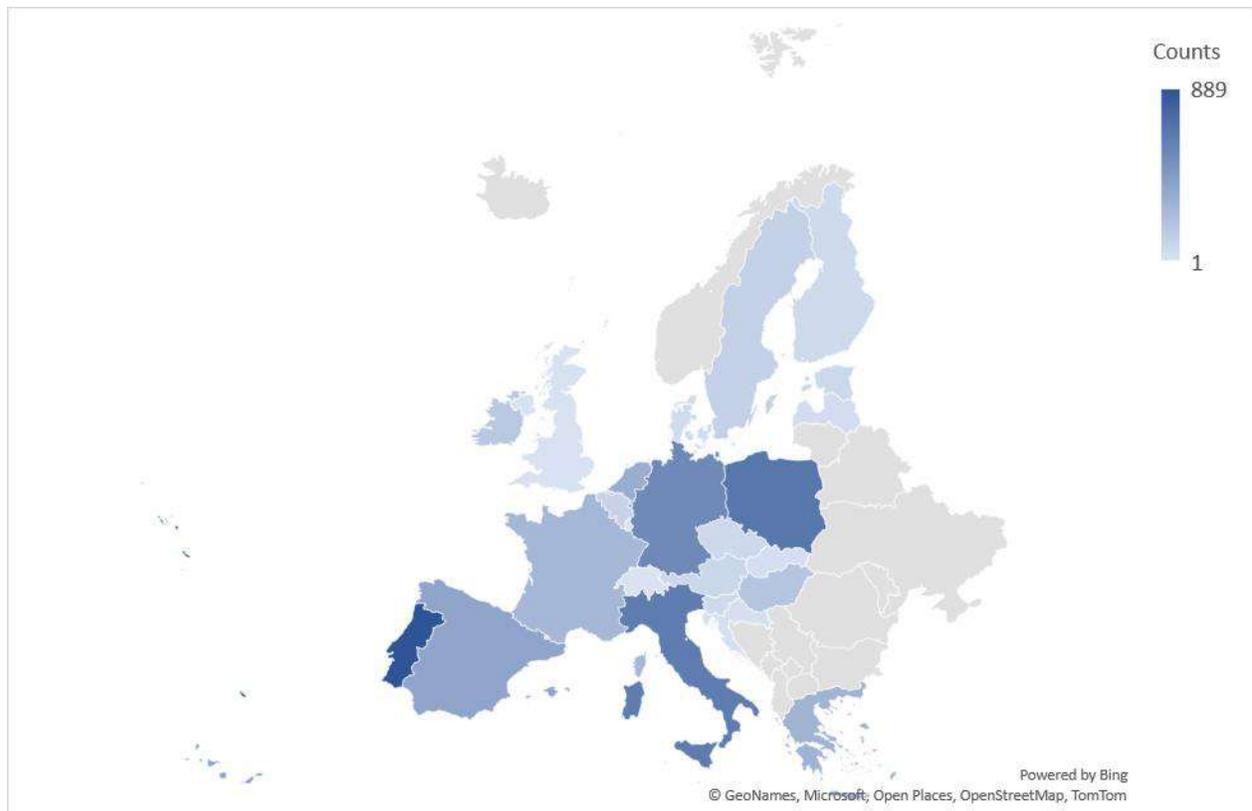
7.5.2. Participants' age distribution

The mean age (Table 29) of the respondents was 30.7 years, with a standard deviation of 9.5 years, reflecting a young and middle-aged population distribution.

Table 29. Age distribution of participants

Age		
category	counts	% of Total
18-24	1530	30.21%
25-34	2182	43.09%
35-44	869	17.16%
45-54	348	6.87%
55-64	106	2.09%
65+	28	0.55%
(Blank)	1	0.02%

7.5.3. Participants' gender distribution

Gender distribution (Table 30) among the respondents confirmed sample's gender diversity, with 41.9% identifying as females, 56.2% as males, 1.5% as non-binary, and 0.4% preferring not to say or identifying as other.

Table 30. Gender distribution of participants

Gender		
category	counts	% of Total
Female	2122	41.90%
Male	2845	56.18%
Non-binary	76	1.50%
other	7	0.14%
Prefer not to say	13	0.26%
(Blank)	1	0.02%

7.5.4. Participants' educational background

The educational background (Table 31) of the sample exhibited a range of attainment levels. specifically, 3.28% had completed advanced graduate work or a Ph.D., and 35.23% held a bachelor's degree. A small portion, 0.69%, did not complete their highest level of education, while high school or GED completion was reported by 17.54% of respondents and 27.39% held a master's degree.

Table 31. Educational background of participants

Level of education		
Category	Counts	% of Total
Advanced Graduate work or Ph.D.	166	3.28%
Bachelor's Degree	1784	35.23%
Did not complete	35	0.69%
High school/GED	888	17.54%
Master's Degree	1387	27.39%
Some college	802	15.84%
(Blank)	2	0.04%

7.5.5. Participants' economic background

The survey also captured the economic background of the participants (Table 32), by assessing net annual household income. The distribution revealed that 27.88% of the respondents fell into the low-income bracket (less than €15,000), 49.19% into the middle-income bracket (€15,001 - €45,000), and 22.93% into the high-income bracket (more than €45,001).

Table 32. Net Annual Household Income distribution of participants

Net Annual Household Income (in Euros)		
Category	Counts	% of Total
€15.001 - €25.000	1036	20.46%
€25.001 - €35.000	836	16.51%
€35.001 - €45.000	619	12.22%
€45.001 - €55.000	436	8.61%
€5.000 or less	474	9.36%
€5.001 - €15.000	938	18.52%
€55.001 - €65.000	287	5.67%
€65.001 - €75.000	171	3.38%
€75.001 or more	263	5.19%
(Blank)	4	0.08%

7.6. EU survey questionnaire frequencies

Indicator	Question	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
INT1	I am planning to buy animal welfare-friendly meat products in the future.	209	571	1386	1881	1017
INT2	The next time that I will do my shopping, I will buy animal welfare-friendly meat products.	428	1078	1893	1202	463
INT3	I am planning to consciously buy animal welfare-friendly meat products instead of products that are not.	359	865	1444	1645	751
WTP2	I am willing to pay for and buy animal welfare-friendly meat products even if a cheaper and less friendly meat product is next to it in the supermarket.	463	1048	1572	1414	567
ATT1	I think that it is good to buy animal welfare-friendly meat products.	45	125	589	1935	2370
ATT2	I believe that consuming animal welfare-friendly meat	157	454	1221	1748	1484

	products has a positive impact on the environment.					
ATT3	I believe that consuming animal welfare-friendly meat products has a positive contribution to animal welfare.	81	208	658	1855	2262
TIC1	I think the quality of meat products with an animal welfare label is better guaranteed.	153	483	1387	2053	988
TIC2	I think the traceability of meat products with an animal welfare label can find the accountable unit for substandard meat.	83	383	1654	2106	838
TIC3	I think if a farm provides meat products with an animal welfare label, it means it is committed to continuously improving its business and production.	117	356	1440	2161	990
PBC1	I can take the decision independently to buy animal welfare-friendly meat products.	61	277	770	2021	1935
PBC2	I have the financial capability to buy animal welfare-	497	1132	1396	1275	764

	friendly meat products.					
PBC3	I have the time to go for buying animal welfare-friendly meat products.	190	770	1411	1807	886
PBC4	I have complete information and awareness regarding where to buy animal welfare-friendly meat products.	755	1705	1420	923	261
PBC5	Animal welfare-friendly meat products are readily available in the location where I reside.	530	1340	1723	1059	412
PBC6	I can handle any (money, time, information related) difficulties associated with my buying decision.	371	1201	1632	1399	461
SN1	The trend of buying animal welfare-friendly meat products among people around me is increasing.	618	1272	1599	1254	321
SN2	People around me generally believe that it is better for health to use animal welfare-	348	906	1694	1579	537

	friendly meat products.					
SN3	My close friends and family members would appreciate if I bought animal welfare-friendly meat products.	479	1039	1905	1210	431
SN4	I would get all the required support (money, time, information related) from friends and family to buy animal welfare-friendly meat products.	937	1457	1628	822	220
GAC1	Buying animal welfare-friendly meat products will indirectly decrease the stress level of production animals.	148	392	1245	2152	1127
GAC2	It is a problem that people do not buy animal welfare-friendly meat products.	254	657	1531	1801	821
GAC3	The welfare of production animals will improve if we buy more animal welfare-friendly meat products.	114	319	1013	2320	1298

GAC4	Low animal welfare is a problem for society.	198	481	1129	1705	1551
NEP1	Humans are severely abusing the environment.	36	108	384	1463	3073
NEP2	Despite our special abilities, humans are still subject to the laws of nature.	22	110	509	1649	2774
NEP3	The Earth is like a spaceship with very limited room and resources.	133	333	754	1747	2097
NEP4	The balance of nature is very delicate and easily upset.	68	312	892	1884	1908
NEP5	Plants and animals have as much right as humans to exist.	123	303	782	1415	2441
NEP6	If things continue their present course, we will soon experience a major ecological catastrophe.	113	234	781	1576	2360
AR1	I am jointly responsible for animal welfare problems.	378	885	1578	1712	511
AR2	I feel jointly responsible for the animal welfare problems of production animals.	516	1021	1504	1557	466

AR3	I feel jointly responsible for the increased stress level of production animals before they get slaughtered.	675	1161	1493	1288	447
AR4	My contribution to animal welfare problems is negligible.	555	1203	2030	1027	249
AR5	Not only the government and food industry are responsible for high non-animal welfare-friendly meat consumption, but me too.	350	866	1538	1727	583
AR6	In principle, individuals at their own cannot contribute to an increase of animal welfare.	375	1071	1453	1621	544
PN1	I feel I should choose animal welfare-friendly products instead of conventional animal products for the sake of animal welfare.	183	387	913	2124	1457
PN2	I get a bad conscience if I choose conventional instead of animal welfare-friendly products.	676	1251	1440	1178	519

AV1	It is important to me that every person has equal opportunities.	38	108	411	1652	2855
AV2	It is important to me that every person is treated justly.	15	56	266	1281	3446
AV3	It is important to me that there is no war or conflict.	31	98	347	1149	3439
AV4	It is important to me to take care of those who are worse off.	48	279	982	1971	1784
EV1	It is important to me to have control over others' actions.	1261	1883	1178	505	237
EV2	It is important to have authority over others.	1668	1868	959	439	130
EV3	It is important to have money and possessions.	127	524	1700	1979	734
BV1	It is important to me to prevent environmental pollution.	73	219	898	2139	1735
BV2	It is important to me to respect nature.	18	76	433	1774	2763
BV3	It is important to me to be in unity with nature.	95	327	1307	1822	1513

		0%	1-5%	6-10%	11-15%	16-20%	›20%
WTP1	I would be willing to pay this extra percentage on products to support the organization's/product efforts to be animal welfare friendly	476	1542	1795	730	349	172

7.7. Structural Modelling Evaluation

7.7.1. Evaluation of measures

We assessed the reliability and validity of the constructs used in the two models, following the guidelines of Hair, Ringle, and Sarstedt (2011). To evaluate the internal consistency reliability and indicator reliability, we employed Cronbach's alpha coefficients and composite reliabilities (CR). The validity of the measurement models was examined through convergent and discriminant validity. For convergent validity, we considered the values of average variance extracted (AVE). Discriminant validity was confirmed by ensuring that the square root of each latent variable's AVE was higher than its correlation with any other latent variable. Additionally, we assessed the heterotrait-monotrait (HTMT) ratios of correlations, the Fornell-Larcker criterion and the values of variance inflation factor (VIF) to further establish the models' validity.

For the TPB model (Table 33), all constructs demonstrated acceptable reliability and validity, with Cronbach's alpha ranging from 0.767 to 0.814 and composite reliability (CR) ranging from 0.862 to 0.889. The average variance extracted (AVE) values were generally above 0.50, with only the PBC construct being marginally below (0.465), confirming a generally good convergent validity. The VIF values for all indicators were below the threshold of 5, indicating no multicollinearity concerns.

Table 33. TPB constructs: Validity & Reliability

Variable	Mean	Standard deviation	Cronbach's α	Composite reliability	Average variance extracted	Variance inflation Factor	Indicator loading
ATT	4.08	0.8	0.815	0.889	0.728		
ATT1	4.28	0.829				1.875	0.885
ATT2	3.78	1.06				1.629	0.807
ATT3	4.19	0.922				2.027	0.866
SN	2.92	0.849	0.787	0.862	0.610		
SN1	2.88	1.11				1.673	0.783
SN2	3.21	1.07				1.746	0.780

SN3	3.01	1.08				1.718	0.839
SN4	2.59	1.09				1.410	0.717
PBC	3.22	0.736	0.767	0.837	0.465		
PBC1	4.08	0.924				1.195	0.555
PBC2	3.13	1.206				1.720	0.716
PBC3	3.48	1.063				1.456	0.748
PBC4	2.65	1.095				1.704	0.687
PBC5	2.9	1.099				1.632	0.618
PBC6	3.07	1.079				1.800	0.744

The HTMT ratios (Table 34) and the Fornell-Larcker criterion (Table 35) further supported the discriminant validity of the constructs.

Table 34. Heterotrait-Monotrait Ratio (HTMT) of TPB model

	ATT	INT	PBC	SN
INT	0.586			
PBC	0.254	0.476		
SN	0.457	0.591	0.589	
WTP	0.349	0.472	0.324	0.380

Table 35. Fornell-Larcker criterion of TPB model

	ATT	INT	PBC	SN	WTP
ATT	0.853				
INT	0.509	0.909			
PBC	0.206	0.397	0.682		
SN	0.371	0.501	0.451	0.781	
WTP	0.320	0.448	0.289	0.342	1

For the VBN model (Table 36), all constructs exhibited strong reliability and validity, with cronbach's alpha ranging from 0.652 to 0.819 and composite reliability (CR) ranging from 0.771 to 0.890. The AVE values were all above 0.50, with high indicator loadings, confirming good convergent validity. All VIF values were below the threshold of 5, indicating no multicollinearity concerns.

Table 36. VBN constructs: Validity & Reliability

Variable	Mean	Standard deviation	Cronbach's α	Composite reliability	Average variance extracted	Variance Inflation Factor	Indicator loading
GAC	3.71	0.81	0.802	0.869	0.624		
GAC1	3.73	0.985				1.593	0.705
GAC2	3.45	1.064				1.895	0.853
GAC3	3.86	0.945				1.866	0.800
GAC4	3.78	1.101				1.582	0.796
NEP	4.21	0.676	0.819	0.869	0.527		
NEP1	4.47	0.784				1.905	0.792
NEP2	4.39	0.788				1.291	0.608
NEP3	4.05	1.029				1.646	0.690
NEP4	4.04	0.959				1.745	0.737
NEP5	4.14	1.037				1.369	0.693
NEP6	4.15	0.991				2.048	0.814
AR	3.09	0.773	0.652	0.771	0.544		
AR1	3.22	1.08				3.295	0.893
AR2	3.09	1.13				4.868	0.928
AR3	2.94	1.17				3.764	0.903
AR4	2.84	1.03				1.125	-0.195
AR5	3.26	1.09				1.953	0.812
AR6	3.18	1.11				1.162	-0.305
PN	3.38	0.998	0.753	0.890	0.802		
PN1	3.85	1.04				1.574	0.899
PN2	2.92	1.19				1.574	0.892
AV	4.4	0.625	0.807	0.874	0.635		
AV1	4.42	0.79				2.042	0.843
AV2	4.6	0.669				1.951	0.829
AV3	4.55	0.758				1.456	0.746

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variable	mean	standard deviation	cronbach's α	composite reliability	average variance extracted	variance inflation factor	indicator loading
AV4	4.02	0.923				1.552	0.765
EV	2.65	0.801	0.667	0.805	0.598		
EV1	2.32	1.094				1.884	0.814
EV2	2.11	1.041				1.955	0.959
EV3	3.53	0.947				1.093	0.461
BV	4.1	0.741	0.802	0.883	0.715		
BV1	4.04	0.906				1.633	0.848
BV2	4.42	0.74				1.963	0.878
BV3	3.86	0.981				1.704	0.810

The HTMT ratios (Table 37) and the Fornell-Larcker criterion (Table 38) confirmed the discriminant validity of all constructs.

Table 37. Heterotrait-monotrait ratio (HTMT) of VBN model

	AV	BV	GAC	EV	INT	NEP	PN	AR
BV	0.654							
GAC	0.446	0.547						
EV	0.220	0.089	0.095					
INT	0.300	0.469	0.638	0.062				
NEP	0.577	0.672	0.594	0.131	0.368			
PN	0.438	0.639	0.884	0.122	0.758	0.575		
AR	0.296	0.449	0.588	0.128	0.463	0.453	0.704	
WTP	0.171	0.266	0.449	0.082	0.472	0.228	0.561	0.385

Table 38. Fornell-Larcker criterion of VBN model

	AV	BV	GAC	EV	INT	NEP	PN	AR	WTP
AV	0.797								
BV	0.530	0.846							
GAC	0.364	0.454	0.790						
EV	-0.183	-0.022	-0.071	0.773					
INT	0.256	0.401	0.550	-0.031	0.909				
NEP	0.476	0.560	0.503	-0.111	0.327	0.726			

PN	0.341	0.499	0.700	-0.044	0.625	0.466	0.895		
AR	0.246	0.367	0.502	-0.003	0.402	0.390	0.561	0.738	
WTP	0.153	0.242	0.409	-0.064	0.449	0.215	0.487	0.346	1

Finally, the dependent latent construct (Table 39) of purchase intention demonstrated good reliability, with a Cronbach's alpha of 0.895 and a composite reliability of 0.935. The AVE for purchase intention is 0.827, showing that a substantial portion of the variance is captured by the construct. The indicator loadings are high, ranging from 0.897 to 0.920, indicating strong validity.

Table 39. Purchase intention construct: validity & Reliability

Variable	Mean	Standard deviation	Cronbach's α	Composite reliability	Average variance extracted	Variance inflation Factor	Indicator loading
INT	3.31	0.989	0.895	0.935	0.827	-	-
INT1	-	-	-	-	-	2.695	0.911
INT2	-	-	-	-	-	2.540	0.897
INT3	-	-	-	-	-	2.964	0.920

7.7.2. Evaluation of structural models: measures of fit

For both the TPB and VBN models, a series of fit evaluations were conducted to ensure the robustness and validity of the models. We estimated the goodness-of-fit (GOF), defined as the geometric mean of the average R^2 values for endogenous variables and the average communality score (AVE values), representing the global fit of partial least squares path modelling (Tenenhaus, Vinzi, Chatelin & Lauro, 2005). According to Henseler et al (2016), GOF values of 0.1, 0.25, and 0.36 correspond to small, medium, and large effect sizes of R^2, respectively. The GOF values for the TPB (0.461) and VBN models (0.467) both exceeded 0.36, indicating a good fit for both models. Moreover, the standardised Root Mean Square Residual (SRMR) measures of both models (TPB = 0.078, VBN = 0.055) were below the suggested threshold of 0.08 (Hu & Bentler, 1999), indicating a good fit.

Additionally, we assessed the coefficient of determination (R^2) and the effect size (f^2), along with the respective path coefficients (Hair et al, 2014). R^2 indicates the predictive

accuracy of the models, ranging from 0 to 1, with 1 representing high accuracy, while f^2 measures the contribution of an exogenous construct in explaining an endogenous construct.

Regarding the TPB model, the R^2 values for intention to purchase and willingness to pay for animal welfare-friendly meat products were 0.403 and 0.180, respectively. In the VBN model, the R^2 values for intention to purchase and willingness to pay for animal welfare-friendly meat products were 0.391 and 0.237, respectively. Furthermore, the values of f^2 in the TPB model ranged from 0.025 to 0.193, and in the VBN model varied between 0.05 and 0.641. Finally, the estimated path coefficients between latent variables in both models were statistically significant. Thus, given the positive results obtained in the selected criteria, we deemed that the structural models were well-designed (fitted) and statistically sound.

7.8. Structural modelling results

7.8.1. TPB model

Assessment results for the TPB model predicting *purchase intention* and *willingness to pay* for animal welfare-friendly meat products are provided below (Table 40 and Figure 9). The analysis revealed that all independent constructs, i.e. *attitude, subjective norm*, and *perceived behavioural control*, significantly affect consumers' intentions and willingness to pay for such products. Regarding *purchase intention, attitudes* (β = 0.336, p < .001) towards animal welfare-friendly meat products was found to be the most significant determinant. This suggests that positive attitudes towards these products strongly influence consumers' intentions to purchase them. Similarly, *subjective norm* (β = 0.276, p < .001) also significantly impacted *purchase intention*, indicating that social pressures or perceived social expectations play a crucial role in shaping consumers' intentions. *Perceived behavioural control* (β = 0.197, p < .001) was also a significant predictor. Overall, the model explained 40.3% of the variance in purchase intention (R^2 = 0.403).

Table 40. Estimation results of TPB model

	original sample (O)	sample mean (M)	standard deviation (STDEV)	Effect size (f^2)	T statistics (|O/STDEV|)	p values	95% confidence interval
ATT → INT	0.366	0.366	0.013	0.193	28.758	<0.001	[0.341, 0.391]
ATT → WTP	0.217	0.217	0.015	0.049	14.786	<0.001	[0.188, 0.245]
PBC → INT	0.197	0.198	0.013	0.052	14.848	<0.001	[0.171, 0.224]
PBC → WTP	0.159	0.159	0.015	0.025	10.578	<0.001	[0.130, 0.189]
SN → INT	0.276	0.276	0.014	0.092	19.643	<0.001	[0.249, 0.304]
SN → WTP	0.190	0.189	0.016	0.031	11.676	<0.001	[0.158, 0.222]

In terms of willingness to pay, *attitude* towards animal welfare-friendly meat products (β = 0.217, p < .001) again emerged as the most significant predictor. This implies that consumers with positive attitudes are more willing to pay a premium for these

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products. *Perceived behavioural control* (β = 0.159, p ‹ .001) was the least important but significant predictor, while s*ubjective norm* (β = 0.190, p ‹ .001) was also a significant determinants of *willingness to pay*, reinforcing the importance of social influence and perceived ease or difficulty of purchasing these products. The model explained 18% of the variance in willingness to pay (R^2 = 0.180).
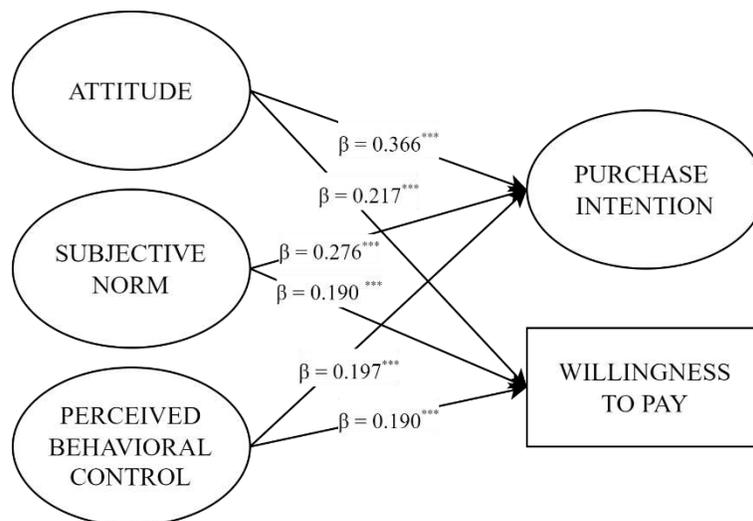

Figure 9. Structural models of Purchase intention and WTP based on TPB[5]

7.8.2. VBN model

The results from the SEM analysis for the VBN model predicting purchase intention and willingness to pay for animal welfare-friendly meat products are provided below (Table 41 and Figure 10). The analysis revealed that *personal norms*, *general awareness of consequences* and the rest of the related constructs significantly affect consumers' *purchase intention* and *willingness to pay* for these products. In terms of structural paths, *personal norm* significantly influenced both *purchase intention* (β = 0.625, p ‹ .001) and *willingness to pay* (β = 0.487, p ‹ .001). This indicates that consumers' moral obligations and personal norms play a crucial role in their decision-making processes regarding the purchase and willingness to pay for animal welfare-friendly meat products. The

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[5] Note: β represent coefficients, ***p < 0,001.

model explained 39.1% of the variance in purchase intention ($R^2 = 0.391$) and 23.7% of the variance in willingness to pay ($R^2 = 0.237$).

Table 41. Estimation results of VBN model

	original sample (O)	sample mean (M)	standard deviation (STDEV)	Effect size (f^2)	T statistics (|O/STDEV|)	p values	95% confidence interval
AV → NEP	0.236	0.236	0.017	0.060	13.866	<0.001	[0.202, 0.270]
BV → NEP	0.434	0.434	0.015	0.211	28.354	<0.001	[0.405, 0.464]
EV → NEP	-0.058	-0.058	0.012	0.005	4.822	<0.001	[-0.082, -0.035]
NEP → GAC	0.503	0.503	0.012	0.339	43.636	<0.001	[0.480, 0.525]
GAC → AR	0.502	0.502	0.012	0.336	42.512	<0.001	[0.478, 0.525]
AR → PN	0.561	0.561	0.011	0.458	49.855	<0.001	[0.538, 0.583]
PN → INT	0.625	0.625	0.010	0.641	61.976	<0.001	[0.604, 0.644]
PN → WTP	0.487	0.487	0.011	0.311	44.913	<0.001	[0.465, 0.507]
R^2: WTP = 0.237, INT = 0.391, GAC = 0.253, NEP = 0.362, AR = 0.252, PN = 0.314							

Furthermore, the *general awareness of consequences* was significantly impacted by the *new ecological paradigm* (β = 0.503, p < .001), indicating that individuals' beliefs about the outcomes of their actions are influenced by their ecological worldview. The NEP, in turn, was significantly influenced by *altruistic values* (β = 0.236, p < .001), *biospheric values* (β = 0.434, p < .001), and negatively by *egoistic values* (β = -0.058, p < .001). This suggests that values related to concern for others and the environment positively shape ecological beliefs, whereas self-centred values have a negative impact. The construct for *ascription of responsibility* was significantly predicted by the *general awareness of consequences* (β = 0.502, p < .001), indicating that individuals who perceive significant consequences from their actions feel a stronger sense of responsibility. In turn, *ascription of responsibility* significantly predicted *personal norm* (β = 0561, p < .001).
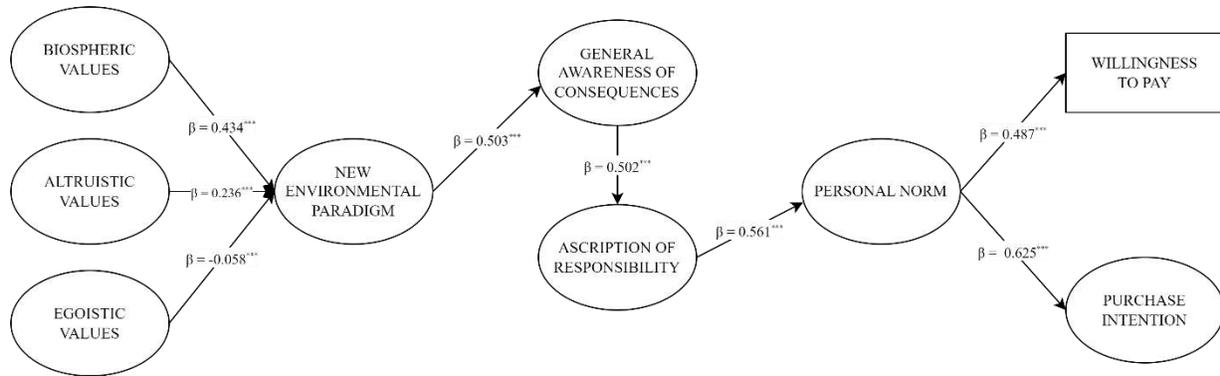
Figure 10. structural models of purchase intention and WTP based on VBN[6]

7.8.3. comparison of VBN and TPB models

The purpose of this study was to compare the two theoretical models discussed above to assess consumer intentions and behaviours toward animal welfare-friendly meat products, using the PLS-SEM approach. The models were evaluated using several criteria included in the smartPLS software, such as the cross-validated Predictive Ability Test (CVPAT; Liengard et al., 2022; sharma et al., 2023), PLS-SEM metrics (shmueli et al. 2016; shmueli et al. 2019), Bayesian information criterion (BIC) for predictive model selection (sharma et al., 2019; sharma et al., 2021) and Akaike weights (Danks et al., 2020; Rigdon et al., 2023). The CVPAT results (Table 42) indicate significant differences in predictive capabilities between the two models. For *Purchase intention*, the average loss was significantly lower for the TPB model (0.790) compared to the VBN model (1.145), with an average loss difference of 0.355. This difference was statistically significant with a t-value of 23.977 (p ‹ 0.001), suggesting better predictive performance of the TPB model for *Purchase intention*. similarly, for WTP, the TPB model also demonstrated better predictive performance with an average loss of 1.146 compared to 1.370 for the VBN model. The average loss difference of 0.224 was again significant, with a t-value of 14.351 (p ‹ 0.001). overall, the TPB model exhibited a lower average loss (0.879) compared to the VBN model (1.201), with a significant average loss difference of 0.322 (t = 25.041, p ‹ 0.001).

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[6] Note: β represent coefficients, ***p < 0,001.

Table 42. CVPAT results

	VBN model	TPB model	Average loss difference	t value	p value
INT	1.145	0.790	0.355	23.977	0.000
WTP	1.370	1.146	0.224	14.351	0.000
overall	1.201	0.879	0.322	25.041	0.000

The PLS-SEM metrics (Table 43) for manifest variables further support the superior predictive power of the TPB model. For the INT1 indicator, the TPB model yielded a lower root mean square error (RMSE) of 0.850 compared to 1.040 for the VBN model, and a lower mean absolute error (MAE) of 0.670 versus 0.868. This pattern was consistent across the intention-related indicators, with the TPB model consistently outperforming the VBN model. For INT2, the TPB model had an RMSE of 0.897 and an MAE of 0.708, while the VBN model had higher errors (RMSE of 1.059 and MAE of 0.808). For INT3, the TPB model recorded an RMSE of 0.918 and an MAE of 0.729, compared to the VBN model's RMSE of 1.110 and MAE of 0.932. For the indicator WTP1, the TPB model also showed a lower RMSE (1.070), and MAE (0.834) compared to the VBN model (RMSE = 1.170 and MAE = 0.889).

Table 43. PLS-SEM metrics

	RMSE VBN model	RMSE TPB model	MAE VBN model	MAE TPB model
INT1	1.040	0.850	0.868	0.670
INT2	1.059	0.897	0.808	0.708
INT3	1.110	0.918	0.932	0.729
WTP1	1.170	1.070	0.889	0.834

Finally, the BIC results (Table 44) underscore the distinct strengths of each model for different dependent variables. For *purchase intention*, the TPB model achieved a remarkably lower BIC of -2581.603 compared to the VBN model's -2492.276. The Akaike weight for the TPB model was 1, favouring it over the VBN model. Conversely, for the WTP variable, the VBN model outperformed the TPB model with a BIC of -1353.456 against -971.562, supported by a non-zero Akaike weight. This contrast highlights that while the TPB model excels in predicting purchase intention, the VBN model is distinctly superior for predicting WTP.

Table 44. BIC results

	BIC	BIC	Akaike weight	Akaike weight

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	VBN Model	TPB Model	VBN Model	TPB Model
INT	-2492.276	-2581.603	0.000	1.000
WTP	-1353.456	-971.562	1.000	0.000