Incentivizing Animal Welfare in Italian Poultry Farming – The Role of Consumers

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Abstract

This thesis investigates Italian consumers' preferences and willingness to pay (WTP) for improved farm animal welfare (FAW) in poultry production. Based on data from an online discrete choice experiment (n = 358), three FAW attributes were assessed: *stocking density*, *growth rate*, and *outdoor access*. A Mixed Logit Model (MXL) reveals an overall strong preference for welfare-enhancing attributes, indicating a general willingness to pay a price premium for FAW improvements. However, substantial heterogeneity in preferences exists. To better capture this variation, a Hybrid Latent Class Model (HLCM) was estimated, incorporating attitudinal variables into class membership. Three distinct consumer segments emerged: *price-sensitive consumers*, with a maximum WTP of €4.05 for outdoor access; *welfare-oriented consumers*, who show the strongest support for welfare improvements and the highest WTP of €10.47 for a longer growing period (46-80 days); and *passive supporters*, who consistently exhibit negative WTP for all attributes, reflecting an intention-behavior gap. This segmentation not only reveals the diverse valuation of welfare-friendly attributes but also underscores the importance of including negative WTP in aggregate welfare assessments to avoid inflated estimates. These findings highlight a clear gap between ethical attitudes and purchasing behavior, particularly among passive supporters. Policy recommendations include implementing a tiered FAW labelling system, providing financial support for producers, and fostering coordinated action along the supply chain. Overall, the results confirm a general willingness to pay a premium for FAW among Italian consumers, while also underscoring the need for inclusive market strategies and targeted policy interventions to effectively translate ethical concerns into purchasing decisions and foster a more animal-friendly poultry sector in Italy.

Keywords: Animal welfare; Farm animal welfare; Willingness to pay; Consumer preferences; Poultry production; Discrete choice experiment; Italy

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Abbreviations

Abbreviation	Description
AW	Animal Welfare
CAP	Common Agricultural Policy
CE	Choice Experiment
CL	Conditional Logit Model
FAW	Farm Animal Welfare
HLCM	Hybrid Latent Class Model
MXL	Mixed Logit Model
WTP	Willingness to Pay

1. Introduction

1.1 Background

In recent decades, the level of Farm Animal Welfare (FAW) on European farms has taken center stage in public and political debates, both influencing and being influenced by consumer behavior. This growing awareness of the impact of intensive farming on both animals and the environment has led to a rising demand for high-welfare certified products reshaping the food market, especially in high-income countries such as the member states of the European Union and the United States (Grethe 2017; Lena 2016). Over the past 10-15 years, consumer across European countries have become increasingly concerned regarding food safety and the food processing methods, with particular interest in organic production, animal welfare (AW) and minimally processed products (Grunert et al. 2004). This shift is demonstrated in Denmark, where 15% of households regularly buy organic food during shopping and approximately 47% buy it frequently or occasionally (Squires et al. 2001). During the purchasing process, each consumer undergoes a complex decision-making process, which begins with comparing similar products and evaluating four key characteristics: *sensory attributes* (e.g., taste and texture), *healthiness*, *convenience* (e.g., ease of preparation), and *production-related factors*. The latter includes how animal-based products are sourced, the methods used, and the farming system, along with the associated level of FAW (Grunert et al. 2000; Grunert 2006).

The concept of FAW is a multi-faceted issue including important scientific, ethical, economic and political dimensions. Dealing with such complex problems requires an integrated approach that utilizes conceptual and methodological skills from many disciplines (Lund et al. 2006). Existing evidence indicates that consumer demand for improving FAW remains on the rise. According to a survey of the European Commission conducted in June 2024, 82% of EU consumers believe that AW needs to be better protected, and 57% of them are willing to pay more for products with higher welfare standards (*EUROSTAT | Developments in organic farming* 2024). Furthermore, a study by Clark et al. (2017) found that, while European consumers exhibit a positive willingness to pay for higher FAW standards, this willingness is moderate. The drive to improve FAW is closely linked to legislative frameworks, farm-level economic outcomes, environmental impacts, and resilience.

The shift in the production process toward higher FAW standards has broad economic, environmental and societal implications. On the one hand, it represents an opportunity to enhancing sustainability from an ethical perspective, potentially improving the industry's public image and long-term viability. On the other hand, it requires a shifting from the conventional production processes, which have traditionally prioritized efficiency and productivity, towards new methods that place greater emphasis on FAW (Jassel 2024). Despite the benefits of higher welfare standards, there are economic challenges for producers. Transitioning to more animal friendly farming systems often requires significant investments,

potentially leading to higher production costs and, consequently, higher prices for consumers. Balancing profitability of European farms with ethical production and the environmental impact remains a key issue in the FAW debate.

Consumers' ethical values and cognitive processes are playing an increasingly important role in purchasing decisions related to products from high AW farming systems. Intrinsic factors such as moral convictions, empathy towards animals, a sense of personal responsibility and knowledge of farming conditions can determine the propensity to pay a premium price for products with higher FAW standards. For instance, a study examining consumers' intentions to purchase plant-based meat alternatives found that personal values (egoistic, biospheric, and social-altruistic) significantly influenced purchase intentions through anticipated positive effects and empathetic concern (Jang & Cho 2022). Moreover, affective responses (such as empathy or discomfort toward farm practices) and cognitive evaluations (e.g., perceived responsibility or knowledge) can substantially influence the decision-making process. Despite the relevance of these constructs, their integration into quantitative models of WTP for FAW remains limited.

Analyzing the three pillars of sustainability within the context of this study, the search for a balance between the different dimensions emerges (Purvis et al. 2019). On one hand the *social sustainability* is explored, investigating consumers WTP and their financial support to sustain AW-enhancing practices. On the other hand, the *economic sustainability* is considered, as more animal-friendly practices require higher investment affecting negatively the stakeholders' cost structure, from farmers to the large-scale retail, ultimately leading to an increase in prices for final consumers. At the same time, *environmental sustainability* is crucial to assess the possible environmental consequences of a more extensive farming model.

In conclusion, investigating consumers' WTP is critical to assess whether the moral concern translates into concrete market behavior, and whether such support can sustain a transition towards more responsible production systems. The economic burden of improving FAW standards ultimately falls on the final consumer, making it essential to understand whether and to what extent consumers are truly willing to pay for these changes.

1.2 Research Problem

The current production system of the European agri-food sector is based on the Common Agricultural Policy (CAP) developed after the II world war, where the main objective was to produce enough food to meet the growing demand, thus ensuring access to food for the European population. Over time, CAP has evolved to adapt to modern needs, shifting from a production maximization model to one more focused on sustainability and innovation, as demonstrated by the last revision related to the period 2023-2027 (*CAP 2023-27 - European Commission* 2025). Among its priorities, regulating and incentivizing FAW has become one of the main objectives, also due to shifting in consumer preferences (Clark et al. 2017). However, while policy measures exist to support higher welfare standards, the economic feasibility of such transitions remains a challenge, particularly given

consumer price sensitivity. To achieve a more sustainable production system, different papers have already studied consumers' WTP for animal-based products with a higher standard of FAW. In a broader context, the increasing WTP for high-welfare broilers systems for Taiwanese consumers demonstrates that the rising concerns about food safety and ethical considerations significantly influence consumer behavior (Yang & Hong 2019). Focusing more on the European context, the higher WTP observed among Finnish consumers for poultry products with higher welfare standards suggests that improvements in farming conditions can be at least partially financed through a price premium that consumers are willing to pay (Heinola et al. 2023). Moreover, extrinsic cues, such as labeling and marketing strategies, may have an impact on consumer expectations and WTP for high-welfare animal products, suggesting that while there is growing consumer interest in FAW, the actual market share of high-welfare products remains limited due to price sensitivity and lack of reliable information (Napolitano et al. 2010). On the production side, several economic challenges have emerged in the integration of FAW into existing markets, highlighting key financial barriers and the tension between consumer expectations and the additional costs borne by producers (Grethe 2017). The economic implications of this transition have been further explored in the egg production sector, where a clear misalignment has been identified between consumers' WTP and the increase in production costs faced by farmers, with negative repercussions on long-term economic sustainability and market equilibrium (Staples et al. 2025).

Focusing more specifically on the Italian context, despite the existing contributions in literature (Rubini et al. 2021; Tiboldo et al. 2024; Cappone et al. 2025), research remains limited on how these factors operate within the Italian poultry sector. In particular, the extent to which Italian consumers are willing to pay a price premium, and which specific attributes strongly influence their purchasing decisions has not yet been investigated. Moreover, while various studies have examined intrinsic psychological factors such as personal values, ethical attitudes, and affective-cognitive processes, few have attempted to integrate these with consumers' WTP for specific product attributes. To date, few studies (e.g., Owusu-Sekyere et al. 2022) has explicitly linked individual values to the WTP for concrete FAW-related characteristics of chicken-based products. This gap limits our understanding of how and why consumers may be willing to support higher FAW standards. As a result, the monetary value that consumers assign to FAW improvements remains unclear, creating uncertainty that may discourage investments by farmers and processing companies. Therefore, this study aims to address this gap by evaluating Italian consumers' WTP for higher-welfare poultry products, identifying the key attributes that influence their choices, and gaining a deeper understanding of the decision-making process behind these preferences.

1.3 Objective of the Study

This study aims to investigate Italian consumers WTP for FAW considering both extrinsic causes (e.g., price and product characteristics) and intrinsic ones (e.g., personal values and ethical concerns). Simultaneously, it seeks to explore the key attributes of FAW that significantly influence consumer purchasing decision. By

providing insights into consumer preferences and price sensitivity, this research intends to serve as a decision-making tool for Italian poultry sector looking to enhance FAW without compromising farm profitability. In the absence of concrete data on the consumers' WTP, both agricultural entrepreneurs and processing companies may hesitate to invest in higher welfare production systems. This because without a clear understanding of the potential price premium consumers are willing to pay, the increased production costs could represent a significant financial risk. Since AW is closely linked to consumers' ethical concerns, values, and attitudes, this study does not limit to analyzing consumers choices from an extrinsic perspective, but also it aims to investigate the role of cognitive and affective drivers in shaping consumer preferences and WTP for higher FAW standards.

The study has three specific objectives. First, to evaluate consumers' WTP for chicken breast produced under higher FAW standards during the rearing phase. Second, to identify the FAW attributes that most influence consumer purchasing behavior, helping businesses and policymakers align production strategies with market demand. Third, to investigate how consumers' personal values, as well as cognitive and affective processes, influence their WTP for FAW-related product attributes.

1.4 Research Hypothesis

Several factors may influence the price premium consumers are willing to pay to cover the extra production cost associated with higher FAW standards. The first factor concerns the intrinsic **attributes of the products**, which are directly related to the farming conditions. Specifically, the study identifies three main attributes that characterize the animal during the farming phase: *livestock density*, a*nimal growth rate*, and *outdoor access*. A second element is the **personal value** and **cognitive biases** of consumers about FAW, as demonstrated by a Finnish study that grouped consumers into five different categories based on their evaluation of product characteristics during purchase. Consumers with stronger ethical concerns or a greater awareness of FAW issues may exhibit a higher WTP, compared to consumers with lower FAW awareness or who prioritize other attributes such as price, label or brand (Heinola et al. 2023).

While the above reasons are more consumers value-oriented, it is necessary also to consider the **economic feasibility** of new production systems. While shopping, most of consumers must face a budget constraint. As a result, although personal values are mainly shaped by ethical and social considerations, consumers' purchasing decisions are ultimately constrained by their financial limitations, which may reduce their actual WTP. For this reason, it is essential to introduce a fourth extrinsic attribute, *price*, as it captures the cost associated with the production system and related practices. Price plays a pivotal role in consumer decision-making and is necessary for estimating WTP. In this context, literature and economics studies distinguish between **use and non-use value**. The concept of *use value* refers to all the tangible and direct characteristics that consumers can perceived and gain from purchasing a product, for example quality and taste of

food. The *non-use value* refers more intangible benefits and characteristics of the products. The motivations leading to this choice don't have direct and immediate benefit for consumers, but derive from personal, ethical or social convictions. This trade-off between ethical preferences *(non-use value)* and financial limitations *(use value)* is crucial in understanding the real demand for higher FAW products.

This study formulates the following hypothesizes. First, Italian consumers are heterogeneous in their preferences for poultry products produced under higher FAW standards. Second, Italian consumers are willing to pay significant price premium for attributes that ensure higher FAW standards during the production process. Third, personal values and attitudes towards FAW, significantly influence consumers' WTP for poultry products produced under higher FAW standards.

If these hypotheses are confirmed, they would open new avenues for further research on market dynamics and incentive strategies. For instance, future studies could explore the divergence between stated and revealed preferences by conducting real-world field experiments. This would provide more accurate insights into how much consumers are actually willing to pay for higher FAW standards and to what extent ethical concerns translate into tangible market behavior, addressing the well-documented gap between intentions and actions (Sheeran & Webb 2016).

1.5   Contribution of the Study

This research will provide relevant insight for various stakeholders involved in the Italian poultry sector. First, to *poultry farmers*: on the one hand, the demand for higher welfare poultry farming is growing, with processing companies and supermarket chains increasingly requesting alternative production methods. On the other hand, farmers feel discouraged from investing in new facilities and machinery for improving welfare standards, as they are not reassured about the penetration of these products in the market. Additionally, they are unsure whether the price premium will be sufficient to cover the increased production costs they face. This study will provide empirical evidence on consumers' WTP for higher FAW poultry products, helping farmers assess the economic feasibility of transitioning to improved husbandry systems.

Second, to *consumers*. This study will help consumers to get a better idea of possible new scenarios if current production were to change. By participating in the surveys simulating different price levels, consumers can better understand the economic implications of alternative production methods. Are they willing to support such a shift? And if so, to what extent? This study aims to provide answers to these questions.

Third, *scientific knowledge*. This study contributes to the literature by exploring how personal values, as well as cognitive and affective processes, shape consumers' WTP for FAW-enhanced food products. Understanding these psychological and behavioral drivers will help refine theoretical models of consumer decision-making in ethical food consumption.

Finally, *policymakers*. This study would also help policymakers and European institutions gain a clearer understanding of consumer preferences and their actual WTP. Moreover, it can be useful also to better understand how European Union should allocate financial help to promote a switch from the conventional livestock farming to higher welfare poultry farming. Indeed, this is a critical step for achieving this change. As shown in a study conducted by *The Association of Poultry Processors and Poultry Trade in the EU Countries* (AVEC), under specific scenarios, the cost per kilograms of poultry meat could increase by around 37.5%, requiring a total investment of €10.7 billion to maintain the current level of meat produced, divided between the capital costs to maintain the current kilograms of meat produced and additional costs to offset the reduction in meat yield per bird due to lower stocking density and lower growth rate (AVEC 2024). These insights can help policymakers allocate resources more efficiently to ensure a sustainable transformation of the poultry sector.

2. Literature Review

In this chapter, the main conceptual and empirical foundations of the study are reviewed. Starting from the definition of FAW, the chapter explores both global and national relevance, with a specific focus on the Italian poultry sector and the role of personal values, ethical concerns and psychological processes during shopping.

2.1 Defining Farm Animal Welfare

Over the past 20 years, the concept of FAW has changed and evolved constantly. Nowadays, FAW is related to *physical area of animal wellbeing*, particularly in connection with how animals might cope with stress and how the body responds to stress physiologically. Therefore, the concept of FAW encompasses three key dimensions: *physical well-being*, which includes health, disease prevention, and proper nutrition; *mental well-being*, ensuring animals feel comfortable, safe, and free from distress or suffering, with humane handling and slaughter practices; and *natural behavior*, which emphasizes the ability of animals to express their innate behaviors in an appropriate environment (Broom 2016). The European Union began discussing FAW in the 1980s, adopting a series of directives aimed at protecting animal well-being. A milestone in the definition of AW is the "*Five Freedoms*" based on the studies and recommendations led by Professor Roger Brambell in UK in 1965. The Brambell Report stated, "*An animal should at least have sufficient freedom of movement to be able without difficulty, to turn round, groom itself, get up, lie down and stretch its limbs*". These freedoms define ideal states rather than standards for acceptable welfare. First, *Freedom from Hunger and Thirst* by ready access to fresh water and a diet to maintain full health and vigor. Second, *Freedom from Discomfort* by providing an appropriate environment including shelter and a comfortable resting area. Third, *Freedom from Pain*, *Injury or Disease* by prevention or rapid diagnosis and treatment. Then, *Freedom to Express Normal Behavior* by providing sufficient space, proper facilities and company of the animal's own kind. Finally, *Freedom from Fear and Distress* by ensuring conditions and treatment, which avoid mental suffering (Farm Animal Welfare Council 2009). Over time, it has influenced legislative efforts and industry standards worldwide, shaping the current discourse on improving FAW in conventional livestock systems. Although there is no official connection between the Brambell Report and the development of European regulations on farm animal protection, the adoption of the first EU AW-laws ten years after the report, closely aligned with its conclusions, suggests that the report had a significant influence not only in the United Kingdom but across Europe (Veissier et al. 2008).

2.2 Legal and Policy Framework in the EU

The European Union has progressively developed a comprehensive regulatory framework for FAW. The cornerstone of this legislation is *Council Directive 98/58/EC*, which regulates minimum standards for the protection of animals kept for farming purposes, including provision related to housing, feeding, and care.

Additional regulations address more specific stages of production, such as transport and slaughter (e.g., *Regulation (EC) No. 1099/2009*). FAW is increasingly viewed not only as an ethical concern, but also as a public health and food safety issue. According to *European Food Safety Authority* (*EFSA*), there is a strong connection between animal welfare, animal health, and the incidence of foodborne diseases. Improvements in welfare standards are thus considered beneficial not only for animals, but also for the sustainability and safety of the food chain (Animal welfare | EFSA 2023). The European Union's commitment to pushing the agricultural sector towards more sustainable production processes was formalized in 2020, by the introduction of the "Farm to Fork" strategy. It is part of the European Green Deal, and it aims to make the entire agri-food supply chain more sustainable while ensuring food security, public health and environmental protection. In this strategy, a particular focus is devoted to improving FAW, through an overall review of regulations, the restriction of antibiotic use to decrease by 50% by 2030, the transition to more sustainable systems in which more outdoor access is provided, lowering the stocking density, the phasing out of cages for laying hens, and finally the introduction of an AW labeling system (Molitorisová & Burke 2023). While the European framework provides general alignment across Member States, the implementation and enforcement of welfare standards still vary significantly. Such differences in national regulations may also influence trade flows within the EU. For example, stricter national AW regulations are associated with a reduction in pork exports, highlighting the trade-offs that producers face between maintaining high welfare standards and remaining internationally competitive (Ferguson et al. 2025).

2.3 WTP for FAW Attributes: Evidence and Key Drivers

Numerous studies have examined consumers' WTP a price premium for products associated with higher FAW standards. The international literature generally indicates a positive WTP for FAW attributes, although the magnitude varies significantly across countries, consumer segments, and specific welfare improvements. A meta-analysis of over 50 studies conducted in various European countries found that consumers are, on average, willing to pay a premium approximately 30% above the base price. However, the study also highlights considerable heterogeneity: WTP tends to be higher in Northern European countries and for fresh animal products, while it is lower for processed goods and in countries with weaker FAW cultures (Clark et al. 2017). A similar average premium was found in a Canadian study, in which consumers showed a strong preference for value-added chicken products that incorporated attributes such as outdoor access and the absence of additives or artificial flavoring (Lorelei et al. 2011). These findings are broadly consistent with the results of another meta-analysis conducted by Lagerkvist and Hess (2011), which examined 106 WTP estimates across 24 studies and showed strong overall consumer support for improved FAW, with WTP significantly influenced by factors such as income, age, and the amount of information provided to consumers. Moreover, the study emphasizes the role of *perceived responsibility*: WTP was lower when welfare improvements were presented as mandatory, suggesting that consumers expect producers or

governments to take the lead in such initiatives. Another European study investigating the relationship between FAW, WTP, and trust in producers emphasized the influence of demographic and psychographic factors, as well as consumer trust in certification schemes. The lack of transparent and institutional labelling systems can reduce WTP by making it more difficult for consumers to identify products that meet higher welfare standards (Nocella et al. 2010). Complementary evidence from a meta-analysis on traceability confirms that consumers are generally willing to pay a positive premium for meat products with verifiable information about origin, safety, and FAW improved condition. The study highlights the role of traceability in supporting transparency and enabling consumers to align their purchases with ethical and safety concerns (Cicia & Colantuoni 2010). These findings are echoed in research focused on Italy, where consumers often express strong ethical concerns about FAW, yet their purchasing behavior does not always reflect these values. As a result, WTP for AW-friendly products tends to be lower than in other European countries. Furthermore, also in the Italian context, the absence of an institutional labelling scheme contributes to consumer confusion and hinders informed purchasing decisions (Martelli 2009).

Among the most investigated attributes affecting consumers preferences and WTP there are *stocking density*, *growth rate, outdoor access, use of antibiotics, litter quality, and environmental conditions*. Regarding these last two issues, modern equipment and materials, such as forced ventilation systems and advanced litter management techniques, can effectively ensure an adequate level of FAW (Banrie 2012; Guo et al. 2022). The use of antibiotics in poultry farms has been regulated by the European Commission, banning the use of growth-promoting antibiotics since 2003 (*European Regulation (CE) N. 1831/2003* 2003). Furthermore, as documented by an Italian report, the use of antibiotics to prevent, treat or control bacterial infections in animals has decreased by more than 90% since 2015 (Rold 2023). This study focuses on three key FAW attributes: stocking density, animal growth rate and outdoor access. *Stocking density*, which refers to the total live weight per square meter, is commonly perceived as a proxy for the physical comfort. Empirical evidence suggests that consumers associate lower stocking densities with better living conditions and are willing to pay more for such products. An 2008 experiment demonstrated that lower stocking densities resulted in body weigh improvements greater than 15%, with no significant differences in cortisol levels, indicating to stable stress level (Meluzzi et al. 2008). Growth rate is another critical factor, as slower-growing broilers are believed to experience less physiological stress and better welfare. While selective breeding for rapid growth has improved production efficiency, it has also raised ethical and health concerns. Van der Eijk et al (2025) argue that slower growth rates, rather than breed per se, are more closely associated with improved welfare outcomes, resonating with ethically motivated consumers, who value naturalness and animal integrity. This aligns with growing consumer awareness about the trade-offs between productivity and welfare. Taiwanese consumers, for instance, have shown significant WTP for meat from chickens raised with lower stocking densities and longer rearing periods, suggesting that preferences for animal-friendly attributes are not limited to Western markets (Yang & Hong 2019). Similarly, *outdoor access* provides chickens with opportunities for natural behaviors such as scratching, pecking, and exploring.

Although it may involve exposure to predators or disease, it is generally viewed favorably by consumers. Outdoor areas not only supports behavioral expression but also enhances consumers' perception of humane treatment, thereby increasing WTP (Campbell et al. 2025). Taken together, these findings underscore how specific farming attributes, especially those perceived as improving the animal's quality of life, play a critical role in shaping consumer preferences and market demand for higher welfare poultry products.

Institutional and transparent labelling also plays a significant role in enhancing consumer confidence and WTP. The introduction of a standardized AW label significantly increased WTP by enabling consumers to make more informed and confident decisions (Gorton et al. 2023). Similarly, a U.S. study found that consumers were willing to pay a 103.5% premium for chicken breast certified with the USDA organic label, compared to a 34.8% premium for a generic organic label (Loo et al. 2011). This large difference underscores the importance of official certification schemes in building consumer trust and justifying higher price points. Their study also highlighted the importance of accounting for heterogeneity in consumer preferences, showing that welfare labels do not affect all consumers equally. This insight has important policy implications: labels and public schemes should offer different levels of certification (e.g., base vs premium) and include subsidies to ensure that even low-income consumers can access animal-friendly products. Building on this, further evidence of preference heterogeneity has been provided by Heinola et al. (2023), who identified five distinct consumer segments based on their priorities. While some segments prioritized low prices, others placed higher value on FAW standards. The largest segment (41%) supported FAW practices but reported only moderate WTP, suggesting a trade-off between ethical concerns and price sensitivity. Other segments ranged from highly committed ethical consumers to those who prioritized cost above all. These findings confirm the importance of recognizing and addressing consumer diversity in both market strategies and policy design. Moreover, specific consumer segments remain willing to pay price premiums for welfare-labelled products, even at high price levels, indicating a strong ethical commitment and the crucial role of personal values when making purchasing choices (Schwickert 2023). The influence of label content on WTP also plays a crucial role in shaping consumer choices, as WTP varies significantly depending on the number and combination of attributes presented on the label (Gao & Schroeder 2009). It was found that adding further information can reduce the perceived value of previously highlighted attributes, stressing the need for clear and targeted labelling strategies. Further support for the effectiveness of welfare labelling has been provided by a British study, where consumers were willing to pay substantially more for meat with higher AW standards (Kehlbacher et al. 2012). The feasibility of a tiered labelling scheme was confirmed, as consumers were shown to differentiate between welfare levels and respond positively to transparent, outcome-based information. Collectively, these findings underscore not only the importance of trustworthy and institutional communication in supporting consumer decisions, but also the need for flexible and inclusive labelling frameworks that reflect the diverse ethical orientations and purchasing behaviors present in the market.

Despite positive trends, the literature also points to several challenges. The first is the *intention-behavior gap*: while consumers may express concern for FAW in surveys, they often fail to act accordingly in real-life purchasing situations due to the price premium. Many are constrained by budget limitations and may not consistently choose welfare-friendly options. This disconnect can lead to biased estimations of actual market behaviors (Sheeran & Webb 2016; Gross et al. 2021). Secondly, transitioning from conventional to higher-welfare production systems can negatively impact producers, retailers, and even consumers. This is due to increased costs, disruptions in supply chains, and reduced satisfaction caused by consumer confusion or unmet expectations (Allender & Richards 2010; Oh & Vukina 2022; Staples et al. 2025). A further challenge lies in reconciling FAW improvements with environmental and economic sustainability. Lowering stocking densities or slowing growth rates may improve welfare but also raise production costs and environmental impacts. For instance, farm profitability increases with higher FAW only up to a certain point, beyond which the costs outweigh the benefits (Figure 1) (Henningsen et al. 2018). Similarly, data from AVEC (2024) suggest that maintaining current production levels under more animal-friendly systems could lead to a 24.4% increase in greenhouse gas emissions (Figure 2) and over 30% more water and feed consumption (Figure 3). These trade-offs highlight the complexity of scaling up FAW without compromising environmental targets or economic viability.

Considering these findings, improving FAW requires a balanced approach that integrates consumer preferences, economic feasibility, and environmental sustainability. While the demand for higher welfare standards is evident, effective implementation depends on informed labelling, targeted policy support, and strategies that bridge the gap between ethical intentions and actual purchasing behavior.
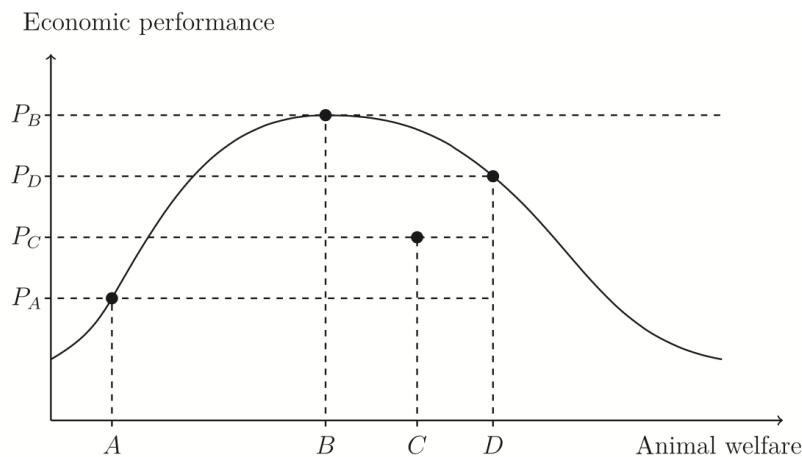
Figure 1. Relationship Between AW and Economic Performance. Source*: "The Relationship Between Animal Welfare and Economic Performance at Farm Level. A Quantitative Study"*- (Henningsen et al. 2018).
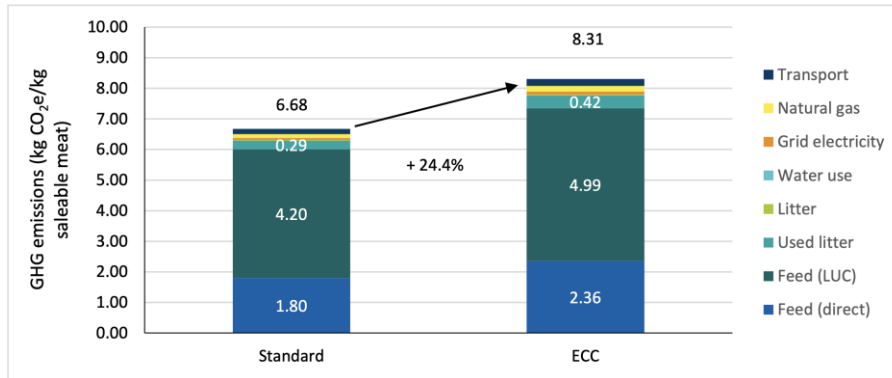
Figure 2. Greenhouse Gas Emissions per kg of Meat Produced for Standard and ECC. Source*: "Cost and implication of the European Chicken Commitment in the EU"- (AVEC 2024).*
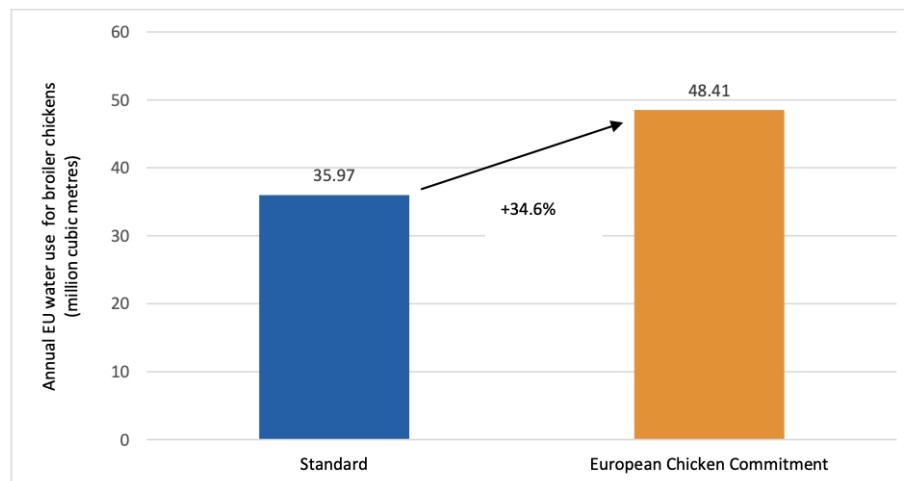
Figure 3. Annual EU Water Use (Million Cubic Meters) for Standard Production and Full Conversion to ECC to Maintain Meat Output. Source*: "Cost and implication of the European Chicken Commitment in the EU"- (AVEC 2024).*

2.4 FAW and the Italian Poultry Sector

Over the last two decades, consumer interest in FAW has grown substantially, but purchasing behavior remains inconsistent with these stated ethical values. Several empirical studies highlight this paradox. For instance, a national survey found that more than 90% of Italian consumers expressed concern for FAW, and over 58% were willing to pay up to 20% more for meat produced under improved welfare standards (Bozzo et al. 2019). However, WTP was strongly associated with certain socio-demographic factors: consumers with higher education levels, those who shop in specialty or organic stores, and individuals who actively seek information on FAW showed significantly greater WTP. Conversely, price-sensitive consumers who shop in discount stores or supermarkets were less inclined to support animal-friendly products. While many consumers express concern for animal treatment,

their actual WTP a premium for welfare-friendly products tend to be lower than in other European Countries (Martelli 2009). Several factors contribute to this inconsistency, such as limited market availability of high-welfare products, price sensitivity among consumers and the absence of a clear, official FAW labelling system, which reduces consumers' ability to make informed decisions (Martelli 2009). Moreover, the lack of trust in available product information limits the effectiveness of ethical concerns at the point of purchase. Although FAW is often associated with higher product quality, this perception is not always sufficient to influence actual choices, due to both economic and informational constraints (Napolitano et al. 2010). Similar findings emerge in related contexts, where while the "organic" label adds value to cured meats, only consumers with strong ethical awareness and trust in certification are willing to pay more, echoing the gap between stated values and actual purchasing behavior (Gaviglio et al. 2012). Italian consumers' WTP for certified animal-friendly products is significantly influenced by trust in certification schemes and supply chain actors. Consumers in Southern European countries, including Italy, tend to have lower trust in the reliability of FAW certifications compared to their Northern European counterparts, which in turn reduces their WTP and undermines market development for welfare-certified products (Nocella et al. 2010). More recent evidence supports these findings, showing that Italian consumers express strong preferences for rearing systems with outdoor access and antibiotic-free claims, but also display limited acceptance of innovations such as insect-based or animal by-product feeds, which are increasingly used for sustainability purposes (Amato et al. 2023). While Italian consumers exhibit growing ethical concern for FAW, their WTP remains fragmented and contingent on factors such as education, trust, place of purchase, and labelling clarity. As such, the Italian poultry sector offers a compelling case study for investigating the socio-economic and psychological drivers that shape demand for high-welfare products and the institutional gaps that must be addressed to enable a more transparent and welfare-oriented market.

2.5 Personal Value, Ethical Concerns and Psychological Processes

While product attributes and economic constraints play a significant role in shaping consumer choices, recent literature highlights the importance of personal values and psychological processes in explaining WTP for ethical and sustainable food products. Several studies have shown that WTP is not driven solely by self-interest or perceived product quality, but also by moral motivations and emotional reactions. First, ethical values such as altruism, and universalism have been consistently associated with stronger support for FAW. Consumers who prioritize self-transcendent values are more likely to express concern for animal treatment and to support welfare-friendly production (Cembalo et al. 2016). This value orientation significantly predicts attitudes toward FAW, complementing demographic or socioeconomic indicators. However, consumers often experience value conflicts: they may act as citizens when expressing strong ethical support for FAW, but shift to consumers at the point of purchase, prioritizing price, convenience or habit (Schröder & McEachern 2004). This duality leads to attitude-behavior gaps, where ethical concerns fail to translate into consistent market

actions. Their qualitative study highlights common coping strategies such as avoidance, suppression of unpleasant thoughts, or delegation of responsibility to institutions. Notably, consumers expressed that if clearer, more honest labelling were available, their purchases might align better with their ethical beliefs. Value orientations, such as altruism, biospheric concern, and egoistic priorities, influence how individuals evaluate credence attributes like FAW. For example, the "warm glow" effect, or the emotional satisfaction derived from supporting a pro-social cause, has been found to significantly increase WTP for ethically produced goods (Fuller et al. 2022). Consumers motivated by ethical concerns may be willing to pay more even in the absence of direct personal benefit. In addition to values, cognitive and affective mechanisms also play a role. Indeed, the visual attention to ethical labels, such as "pesticide-free" or "GMO-free", and feelings of concern or worry about production methods are both significantly associated with higher WTP. These findings suggest that label visibility, emotional engagement, and information processing influence decision-making in meaningful ways, beyond purely rational trade-offs (Grebitus & Van Loo 2022).

Taken together, this body of research indicates that consumer preferences for animal-friendly products cannot be fully understood through observable characteristics alone. Latent psychological constructs, such as ethical concern or perceived responsibility, may help explain variation in behavior across individuals. From a theoretical perspective, FAW science should be understood as a "*bridging concept*" that links scientific evidence with public ethical concerns. There are three overlapping moral dimensions of FAW: *natural living*, *affective experiences*, and *biological functioning*. Each of these is valued differently by consumers depending on their personal beliefs and value systems, suggesting that no single scientific indicator can fully capture what matters morally to the public (Fraser et al. 1997). Importantly, social context and perceived moral intensity also influence how much consumers are willing to pay. In a contingent valuation study, individuals exposed to information emphasizing *social consensus* about the moral unacceptability of poor slaughter practices reported significantly higher WTP (Bennett & Blaney 2002). This supports the idea that social norms, when made salient, can enhance the perceived ethical urgency of FAW issues and thus increase consumer engagement.

These insights have led to the adoption of hybrid choice models, such as Hybrid Latent Class Models (HLCM), which combine choice data with attitudinal indicators to capture the full spectrum of consumer motivations. Understanding these underlying psychological drivers is particularly relevant in the context of FAW, where intention-behavior gaps are common, and market signals are often unclear. As this thesis aims to analyze Italian consumers' WTP for higher FAW standards, the integration of attitudinal data is essential to capture the heterogeneity of preferences and the deeper value systems that inform them.

3. Methodology

In this chapter, the structure of the CE and the econometric models are specified and discussed in detail based on the above empirical specifications.

3.1 Theoretical Framework

This study is grounded in *Rational Choice Theory*, the *Theory of Value* and the *Random Utility Theory*. According to Rational Choice Theory, individuals are assumed to make decisions that maximize their utility based on personal preferences and within the limits of certain constraints, such as income, time, and available information (Becker 1976). In the context of CE, it is assumed that each respondent first analyses the proposed alternatives and their attributes, then assigns a utility level to each alternative, and finally chooses the one that offers the highest utility, which may vary across individuals (Oppenheimer 2008). Supporting this concept is the Theory of Value, which states that the value of a good or a service is determined by the utility it provides to individuals and is therefore subjective (Varian 2014). Within this framework, value is not intrinsic to the good itself but is derived from individuals' preferences and their WTP for specific attributes. When applied to choice modelling, product attributes (e.g., AW improvements) are valued to the extent that they increase the perceived utility of a product. The WTP thus represents the monetary value individuals assign to these utility-enhancing attributes, capturing their subjective valuation through observed trade-offs between attributes and price (Lancaster 1966). These theories lead to the principles of the Random Utility Theory, which assumes that respondents select the alternative that maximizes their perceived utility among the available options, allowing researchers to explore the respondents' WTP for specific product attributes (Miller 2001). According to this theory, individuals assign a utility value to each available alternative. However, since utility is not fully observable to the researcher, total utility is typically decomposed into a systematics component, based on observable product attributes, and a random error term capturing unobserved factor:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \tag{1}$$

U_{ij} is the total utility, V_{ij} is the systematic (observable) component, which is estimated based on the characteristics of the product (e.g., stocking density, slaughter age, external access and price) and ε_{ij} is the random (unobservable) component which capture unmeasured individual preferences, measurement errors, and other sources of unexplained variation. In this context, the deterministic component V_{ij} in formula (1) is modeled as:

$$V_{ij} = \beta_0 + \beta_1 Density_{8\_9} + \beta_2 Density_{10\_12} + \beta_3 Growth_{46\_80} \tag{2}$$
$$+ \beta_4 Growth_{81\_90} + \beta_5 Outdoor + \beta_6 Price$$

The variables represent the product attributes included in the CE:
- *density_8_9* and *density_10_12*: dummy variables for stocking density (reference category: 13-17 chickens/m²), *growth_46_80* and *growth_81_90*: dummy variables for the age at slaughter (reference category: 40-45 days),

- *outdoor*: dummy variable indicating access to outdoor areas (reference: no outdoor access),
- *price*: continuous variable indicating the price of the product.

Since a specific part of the utility is not observable, it is not possible to know with certainty which alternative will be chosen by the individual, but it is possible to estimate the probability by which the individual i chooses the alternative j over all the possible alternatives $k \neq j$:

$$P_{ij} = \Pr(U_{ij} > U_{ik}) \ \forall k \ \neq j \tag{3}$$

This means that the probability of choosing alternative j is the probability that its utility is greater than the probability of all other alternatives k. Depending on the assumptions made about the distribution of the random component ε_{ij}, different choice models are obtained. There is a widely documented literature about the complex mental process of creating personal opinions leading to actual choices, attitudes and decisions for reacting in real-life situations, where consumers try to maximize their utility function at the lowest possible cost (Ajzen 2002; Stankevich 2017; Albrecht et al. 2023).

3.2 Empirical Model Specification

3.2.1 *Mixed Logit Model (MXL)*

The first model employed in this study is the *Mixed Logit Model* (MXL), it allows utility coefficients to vary randomly across individuals, thus capturing unobserved preference heterogeneity (Train 2009). Moreover, it also accounts for correlations across repeated choices by the same individual, which is essential when using panel data, as often occurs in CE designs (Greene & Hensher 2003; Hensher & Greene 2003). By incorporating liking scores into the utility function, they captured both rational and emotional influences, though without explicitly modelling latent psychological variables (Gross et al. 2021).

In the MXL, the total utility of alternative j for individual i in choice situation t is defined as:

$$U_{itj} = V_{itj} + \varepsilon_{itj} \tag{4}$$

Where:
- $V_{itj} = \beta_0 + \sum_{k=1}^{n} \beta_k X_{itj}^k + \varepsilon_{itj}$ is the deterministic component of utility in scenario t,
- X_{itj}^k represent the product attributes, such as stocking density and age at slaughter,
- β_k are the random coefficients that measure the influence of each attribute on the choice probability,
- ε_{itj} is a random error term that captures the individual variability, particularly for the random attributes.

In this model the objective is to estimate the probability of choice for each option by each participant. The probability of choosing P_{itj} for individual i and option j in a given scenario t, is given by:

$$P_{itj} = \frac{\exp(V_{itj})}{\sum_{k' \in C_i} \exp(V_{itk'})} \tag{5}$$

Individual variability is modelled using distributions for the parameters β_k, which can be randomly distributed. This allows for accounting for differences in preferences across participants. The estimated coefficients from the model were not directly interpretable in economic terms, as they reflect respondents' utility levels and not monetary values. Therefore, implicit prices for each level of the FAW attributes were derived by calculating the ratio between the attribute-specific coefficient and the price coefficient, allowing for the estimation of WTP values. This framework also enables the estimation of the relative importance of each attribute in the decision-making process and, consequently, the implicit WTP for given attribute:

$$WTP = -\frac{\beta_{attribute}}{\beta_{price}} \qquad (6)$$

3.2.2 *Hybrid Latent Class Model (HLCM)*

While MXL is effective in capturing preference heterogeneity, HLCM further enhances this approach by integrating psychological constructs (i.e. values, attitudes and beliefs) which are often key drivers in ethical consumption decisions. For instance, in addition to the economic perspective, consumers' choices are also influenced by behavioral and cognitive processes. These behavioral aspects help explain heterogeneity in preferences and justify the need for a more flexible model. The model combines a choice component based on product attributes and latent traits, a measurement model linking survey responses to latent constructs, and a structural model explaining how these constructs influence preferences and WTP (Bahamonde-Birke & Ortúzar 2021; Mariel et al. 2024).

The probability of belonging to a latent class c for the individual i is given by the logit probability function:

$$P_{ic} = \frac{\exp\left(\alpha_c + \sum_{k=1}^{n} \gamma_k Z_i^k\right)}{\sum_{c' \in C_i} \exp\left(\alpha_{c'} + \sum_{k=1}^{n} \gamma_k Z_i^k\right)} \qquad (7)$$

where:
α_c is a parameter that captures the probability of belonging to class c.
Z_i^k are the covariates that determine the membership to each class (e.g., age, income, attitudes towards AW).
γ_k are the coefficients of the covariates.
For each class c, the utility function V_{itj}^c for option j is similar to the MXL, but the coefficients β_K are distinct for each class:

$$V_{itj}^c = \beta_{0c} + \sum_{k=1}^{n} \beta_{kc} X_{itj}^k + \varepsilon_{itj}^c \qquad (8)$$

The probability of choosing option j in scenario t, given that the individual belongs to class c, is:

$$P_{itj}^c = \frac{\exp\left(V_{itj}^c\right)}{\sum_{k \in C_i} \exp\left(V_{itk}^c\right)} \qquad (9)$$

Similar to the LXM, the estimation of WTP for attribute k in class c is determined as follows, with the added consideration of psychological factors that may influence WTP:

$$WTP_{kc} = -\frac{\beta_{kc}}{\beta_{price}} \tag{10}$$

By doing so, HLCM provides a more comprehensive understanding of consumer segmentation and of how different consumers value FAW attributes in food products.

3.3 Choice Experiment

3.3.1 Introduction to the Choice Experiment and Survey Structure

This study, as previously specified, employed an unlabeled DCE to estimate Italian consumers' WTP for improving FAW in broiler production. The CE is grounded in Random Utility Theory and allows for the elicitation of consumer preferences by representing hypothetical scenarios that vary across defined product attributes. This method is particularly suited for valuing non-market characteristics such as FAW, as it reveals trade-offs individuals are willing to make between different products features and price. The survey conducted is based on three main divisions and before entering to the choice cards, it was carefully showed with an example the setup of the survey and explained the different attributes.

3.3.2 Attribute Selection, Price Levels, and Experimental Design

The first section of the survey aims to explore specifically the WTP of Italian consumers for specific attributes that enhance FAW during the breeding phase. Specifically, the survey investigates the WTP for improvements in *stocking density*, *growth rate*, and *outdoor access*. The specific attributes selected are based on a scientific literature review related to FAW in the poultry farm. The *price* levels were defined to reflect realistic cost differences resulting from variations in rearing conditions, ensuring that the choice scenarios presented to respondents simulate real-world trade-offs between FAW and price. The price premium for the new production systems was determined as follows: the first price level was calculated by analyzing the average price of whole chicken breast packs listed on the online shopping platforms of four major Italian supermarket chains, thereby reflecting the actual average market price in Italy. The average price in the conventional farming for 500g of chicken breast is €5.66 (i.e. corresponding to 11.32€ per kg). The second price level reflects a 37.5% increase in production costs under specific regulatory standards, which is assumed to translate into an equivalent increase in the final retail price (AVEC 2024). The third price level is based on findings from a recent article showing that the price of "organic" chicken is typically 60% to 70% higher than conventional products (Balboni 2024). Finally, the fourth price level extrapolates the price difference between the second and third levels, to define a complete price range for the experiment. The levels of all the attributes used in the CE are shown in Table 1. To facilitate a better understanding, a summary of the acronyms used in the model estimation and result analysis is included.

Table 1. Welfare Attribute and Price Premium Levels Used in the Choice Experiment.

Attributes	Levels	Acronym
Stocking density	Level 1: 13-17 chickens/m² Level 2: 10-12 chickens/m² Level 3: 8-9 chickens/m²	*space_10_12* *space_8_9*
Slaughter age	Level 1: 2.5-3 kg in 40-45 days Level 2: 2-3 kg in 46-80 days Level 3: 2-3 kg in 81-90 days	*growth_46_80* *growth_81_90*
Outdoor access	Level 1: No access Level 2: Access available	*outdoor access*
Price	Level 1: €5.66 Level 2: €7.78 Level 3: €9.05 Level 4: €10.33	

The attributes and their levels were combined using Ngene software. Based on a MNL model and an efficient experimental design, 12 choice situations were generated. These 12 choice situations were divided into 2 blocks, with each block containing 6 choice sets. Each choice situation included two alternatives (Options A and B) and a "no-buy" option. Option A and Option B represented two 500g chicken breast packages featuring different combinations of attribute levels, while Option C offered the possibility of not buying any product. Respondents were randomly assigned to one of the two blocks. An example of the choice cards is reported below (Figure 4).

ATTRIBUTE	OPTION A	OPTION B	OPTION C
Stocking density	8-9 chickens per m²	13-17 chickens per m²	
Slaughter age	40-45 days	46-80 days	No-buy option
Outdoor access	Yes	No	
Price (€/500g)	€10.33	€5.66	

Figure 4. Example of Possible Choice Card in the CE.

3.3.3 Exploring Ethical Concerns and Respondent Backgrounds

The second section aims to explore consumers' personal values related to FAW. Understanding these underlying values helps to contextualize consumer behavior and explain heterogeneity in WTP. This section includes two sets of Likert-scales statements, each targeting slightly different dimensions of consumer attitudes. Table A1 (Appendix 1) focuses more on individual ethical and emotional concerns about FAW. The statements explore the extent to which participants derive personal satisfaction from supporting AW initiatives, consider the ethical treatment of animals essential, and are willing to accept higher production costs to ensure better living conditions for animals. Table A2 (Appendix 1) evaluates participants' level of concern for specific AW issues commonly associated with intensive livestock farming, such as overcrowding, transportation conditions and antibiotic use. Each statement was rated using a five-point Likert scale. In Table A1 (Appendix 1), the scale ranges from "*Strongly disagree*" to "*Strongly agree*", while in Table A2 (Appendix 1) it ranges from "*Not concerned at all*" to "*Very concerned*". This dual approach captures both personal convictions and issue-specific concerns, which can subsequently be used to explain variations in choice behavior within the CE framework.

The third and final section collects sociodemographic information from respondents, including gender, age, and education level. These variables are essential for profiling the sample and conducting subgroup analyses to assess how WTP varies across different population segments. In addition, respondents were asked about their dietary habits, specifically whether they regularly consume meat. Individuals who identified as vegetarian or vegan were excluded from the dataset to ensure that responses accurately reflect the preferences of active meat consumers (i.e., those who are more likely to be potential buyers of chicken meat). Collecting this information allows for a more comprehensive interpretation of the results and supports the use of interaction terms in the econometric model, improving the robustness of the analysis.

3.4 Study Area and Data Collection

The data for this study were collected in Italy, targeting Italian consumers through an online survey. The questionnaire was designed using Qualtrics, a leading platform for survey development. Data collection was conducted through online distribution on social media platforms such as WhatsApp, Instagram, and LinkedIn, enabling the recruitment of a diverse sample across different regions of the country. The survey was presented in both English and Italian versions. The final dataset used in the study consist of 358 respondents. Prior to the official launch, the questionnaire was pre-tested with a small group of respondents (N = 20) with the aim of evaluating and improving the experimental design, as well as increasing consumers' overall understanding of the survey format. Based on their feedback, minor adjustments were made to improve the wording and layout of certain questions. The final data collection took place between March 26th and May 5th, and

responses were collected anonymously to encourage honest and unbiased participation. Table 2 shows descriptive statistics of the sample.

Table 2. Descriptive Statistics of Respondents' Sociodemographic Characteristics.

Characteristic	Variable	Description[1]	%
Gender			
	Male	1 if gender is male	39.11
	Female	1 if gender is female	59.78
	Other	1 if gender is "other gender"	1.12
Age			
	age_18_29	1 if age between 18 and 29	57.82
	age_30_45	1 if age between 30 and 45	20.39
	age_46_60	1 if age between 46 and 60	17.32
	age_61plus	1 if age is older than 60	4.47
Education Level			
	middle school	1 if EL is middle school education	3.35
	high school	1 if EL is high school education	34.64
	bachelors' degree	1 if EL level is bachelor's degree	27.09
	master's degree or higher	1 if EL level is master's degree or higher	34.92
Monthly Income Level			
	inc_less_1k	1 if net income <1,000€	28.49
	inc_1k_2k	1 if net income between 1,000€ and 2,000€	27.65
	inc_2k_3k	1 if net income between 2,000€ and 3,000€	22.07
	inc_3k_4k	1 if net income between 3,000€ and 4,000€	5.87
	inc_4k_5k	1 if net income between 4,000€ and 5,000€	2.79
	inc_5k_6k	1 if net income between 5,000€ and 6,000€	2.51
	inc_6kplus	1 if net income >6,000€	9.5

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[1] Note: All variables are coded as binary indicators (1 = yes; 0 = no).

4. Results

This chapter presents the empirical results of the discrete choice models. The models are reported in increasing order of complexity, starting from the Conditional Logit model (CL) (see Appendix 2), which assumes homogeneous preferences, and progressively incorporating unobserved heterogeneity through Mixed Logit (MXL) and Latent Class specifications (HLCM). The final model includes attitudinal variables to explore the role of ethical concerns in class membership and consumer segmentation.

4.1 Heterogeneity Assumption: Mixed Logit Model (MXL)

To account for unobserved preference heterogeneity among respondents, a MXL model was estimated using 500 Halton draws (see results in Table 3). The model achieved convergence with a final log-likelihood of -1732.53, representing a substantial improvement over the conditional logit specification with log-likelihood of -1829.22 (ΔLL = 96.69). The likelihood ratio test confirmed a significant improvement in model fit.

The results in Table 3 show that all mean utility estimates were statistically significant at the 1% level and displayed the expected signs. The coefficient for price is negative (-0.087), indicating decreasing utility with increasing price. All FAW-related attributes had positive coefficients (Table 3), suggesting that respondents, on average, valued improvements in FAW. The highest utility gain is associated with *space_10_12 (*1.94), followed by *space_8_9* (1.37). Significant standard deviations were observed for most attributes, confirming preference heterogeneity across respondents. These results indicate that while average preferences are positive, the degree of importance assigned to each attribute varies considerably among individuals.

Table 3. MXL Model for Heterogeneity of Preferences.

Choice	Coef.	Std. Err.	z	P>|z|
Utility estimates				
price	-0.087***	0.012	-6.99	0.000
space_8_9	1.369***	0.101	13.61	0.000
space_10_12	1.949	0.431	4.51	0.000
growth_46_80	1.372	0.171	7.99	0.000
growth_81_90	0.498***	0.092	5.40	0.000
outdoor access	1.256***	0.098	12.73	0.000
Standard Deviation				
space_8_9	-0.395	0.208	-1.90	0.058
space_10_12	1.893	0.470	4.03	0.000
growth_46_80	1.688	0.209	8.07	0.000
growth_81_90	0.673	0.172	3.90	0.000
outdoor access	1.152	0.105	10.94	0.000
Log Likelihood	-1732.53			
Pseudo R2	0.1202			

***, **,* indicates significance at 1%, 5% and 10% level, respectively.

4.2 Hybrid Latent Class Model (HLCM) - Including Personal Values and Attitudes

A HLCM with three latent classes was estimated to capture unobserved preference heterogeneity while accounting for attitudinal factors as class membership covariates. The model reached convergence with a final log-likelihood of -1562.87, marginally improving the fit over the standard LCM without attitudinal variables. The model identified three distinct consumer segments, with the following features: **Class 1** (18.8% of the respondents) showed negative price sensitivity (-0.357) and positive but moderate preferences for FAW attributes, especially *outdoor access* (+1.45) and *space* improvements. **Class 2** (42.6% of the respondents) exhibited a positive price coefficient (+0.132), suggesting inconsistent behavior with standard economic expectations. However, the class still revealed positive and statistically significant preferences for all FAW attributes. **Class 3** (38.7% of the respondents) was the most welfare-conscious segment, with strong and significant preferences for all FAW attributes, and the most negative price coefficient (-0.612). The highest attribute values were found for *growth_46_80* (+6.48), *outdoor access* (+5.35), and *space_8_9* (+4.07), indicating a pronounced WTP for improved FAW conditions. The class membership model incorporated two attitudinal predictors: *personal_faw* (internal ethical orientation) and *attitude_faw* (general concern for FAW). The results showed a significant effect of *attitude_faw* on **Class 2** membership (p=0.039), suggesting that individuals expressing general concern for FAW were more likely to belong to this segment, even though their choice behavior may reflect inconsistencies between ethical concern and price sensitivity. About *personal_faw*, it was not statistically significant for any class comparison, indicating that deeply internalized values were less predictive of class membership than externally

expressed attitudes. The estimates are reported below, showing substantial differences in valuation across segments, with **Class 3** exhibiting the highest WTP for all welfare improvements.

Table 4. Estimated Coefficients of the HCLM.

Choice	Coef.	Std. Err.	z	P>|z|
Utility estimates				
Choice 1				
price	-0.356***	0.043	-8.22	0.000
space_8_9	1.068***	0.254	4.19	0.000
space_10_12	0.612**	0.303	2.02	0.043
growth_46_80	0.154	0.250	0.62	0.538
growth_81_90	0.738***	0.253	2.91	0.004
outdoor access	1.445***	0.248	5.82	0.000
Choice 2				
price	0.132***	0.022	5.78	0.000
space_8_9	1.124***	0.132	8.51	0.000
space_10_12	1.191***	0.430	2.77	0.006
growth_46_80	1.063***	0.197	5.40	0.000
growth_81_90	0.336***	0.115	2.92	0.004
outdoor access	0.3548**	0.180	1.97	0.049
Choice 3				
price	-0.612***	0.120	-5.10	0.000
space_8_9	4.066***	0.616	6.59	0.000
space_10_12	2.488***	0.615	4.04	0.000
growth_46_80	6.481***	1.105	5.87	0.000
growth_81_90	2.613***	0.540	4.83	0.000
outdoor access	5.354***	0.809	6.61	0.000
Class 1 membership estimates				
Personal values FAW	0.257	0.232	1.11	0.268
Attitude FAW	0.347	0.240	1.45	0.147
constant	-0.7401	0.241	-3.06	0.002
Class 2 membership estimates				
Personal values FAW	-0.011	0.180	-0.06	0.950
Attitude FAW	0.441**	0.213	2.06	0.039
constant	0.096	0.311	0.31	0.757

***, **,* indicates significance at 1%, 5% and 10% level, respectively.

Table 5. WTP by Attributes in the HLCM with Personal Values and Attitudes towards FAW.

Attribute	Class 1	Class 2	Class 3
space_8_9	2.99	-8.51	6.57
space_10_12	1.72	-9.02	4.02
growth_46_80	0.43	-8.05	10.47
growth_81_90	2.07	-2.55	4.22
outdoor access	4.05	-2.68	8.65

5. Discussion

5.1 Overview of Main Findings

The findings of this study provide strong empirical support for the central hypotheses outlined in the introduction.

First, the results confirm the presence of substantial heterogeneity in consumer preferences for FAW attributes in poultry production, validating *Hypothesis 1*. This was evident across all model specifications, with both the MXL Model and HLCM revealing significant variation in how respondents value different FAW-related characteristics.

Second, the analysis demonstrates that a significant portion of Italian consumers is willing to pay a premium for improvements in farming practices that enhance FAW. According to the HLCM, WTP estimates were consistently positive and economically significant for Class 1 and Class 3, supporting *Hypothesis 2* and indicating that there is a viable market for high-welfare poultry products in Italy.

Third, the integration of attitudinal variables into the HLCM shows that ethical concerns and personal values play a relevant role in shaping consumer choice, providing partial support for *Hypothesis 3*.

Overall, the results indicate that Italian consumers exhibit substantial heterogeneity in their behavior towards FAW. Indeed, they can be categorized into three distinct segments. The first segment consists of **Price-sensitive consumers**, who are primarily driven by price considerations. The second group includes **Passive-supporters**, who express ethical concern for FAW but do not consistently reflect these values in their purchasing behavior. Finally, the third segment comprises **Welfare-oriented consumers**, who demonstrate a strong ethical commitment and a clear WTP a premium for products with higher welfare standards.

5.2 Interpretation of Hybrid Latent Class Model

The segmentation provided by the HLCM reveals three distinct consumer profiles, each characterized by unique patterns of preferences, price sensitivity, and attitudinal alignment. These classes represent meaningful divisions in the Italian consumer population in terms of their approach to FAW. Class 1 (***Price-sensitive consumers***, 18.8% of the respondents) are primarily characterized by a *price sensitivity*, with a negative price coefficient (-0.357). While they express positive preferences for FAW-related attributes, particularly *outdoor access* and *reduced stocking density*, their WTP remains relatively modest, with an average of *€4.05* for *outdoor access* and between *€1.72* and *€2.99* for *stocking density* improvements. This group appears willing to support minor improvements in FAW as long as the associated costs remain low. Their behavior reflects a pragmatic approach, where ethical concerns are balanced with economic constraints.

Class 3 (*Welfare-oriented consumers*, 38.7% of the respondents) represents the most ethically committed and economically coherent group. Consumers in this class exhibit strongly negative price sensitivity (-0.612) and highly positive preferences for all FAW attributes, showing themselves particularly sensitive to *growth rate* and *outdoor access* attributes, suggesting a deep concern for both the quality and duration of animal lives. Their WTP values are significantly higher than those of other segments, making them a clear target for premium product positioning. The highest WTP value is shown for *growth_46_80* (10.47€), followed by *outdoor access* (8.65€) and *space_8_9* (6.57€) This group aligns closely with profiles identified in previous studies (Clark et al. 2017; Heinola et al. 2023), where consumers' moral and ethical values are directly reflected in their willingness to support higher welfare production systems.

Turning to consumers in Class 2 (42.6% of the respondents), this group represent the largest share of the sample and reveals a notable *discrepancy between declared ethical concern and choice behavior*. Despite positive and statistically significant preferences for all FAW attributes (see results in Table 4), consumers in this class exhibit a *positive* price coefficient, suggesting they may not penalize price increases, or alternatively, may not engage in consistent cost-benefit reasoning during decision-making. This paradoxical price response may suggest that consumers perceive FAW improvements as socially desirable but also believe that *the cost of such improvements should not fall on consumers*, hinting at a perceived right to ethical production that should be covered by producers or public institutions. Descriptive statistics support this interpretation: 54% of respondents believe that transition costs should be covered by the government, while only 14% think they should be borne by consumers (Figure 6). Interestingly, this is the only segment in which the attitudinal variable *attitude_faw* is statistically significant, indicating a strong general concern for FAW. However, this concern does not clearly translate into economically rational choices, suggesting the presence of an attitude-behavior gap. For this reason, they are labeled as ***passive-supporter consumers***: individuals who vocally support FAW but may not consistently act on that support when confronted with real or simulated purchasing decisions.

This interpretation is reinforced by the findings illustrating consumer expectations about who should cover the higher production costs. Between 39% and 41% of respondents believe consumers themselves or farmers should pay less of the transition costs, while most of the cost should be borne by government and processing companies (Figure 6). This discrepancy between high WTP and the expectation of government responsibility underscores the *intention-behavior gap* discussed in the literature (Sheeran & Webb 2016; Gross et al. 2021). It suggests that, although ethical concern is widespread, there is a perception that structural support and public funding are essential to enable this transition.

Importantly, this behavioral pattern closely aligns with the findings of Bass et al. (2021) who highlight the methodological importance of allowing for negative WTP and willingness to accept (WTA) in consumer valuation studies. They argue that ignoring the potential for negative WTP, particularly in the context of goods with

ethical or environmental externalities, can result in upwardly biased welfare estimates and a misleading representation of consumer support. In this model, the positive price coefficient for Class 2 implies systematically negative WTP for all FAW attributes, meaning these consumers would require compensation (a WTA framework) rather than paying a premium to support these improvements. This negative valuation is crucial to capture, as it reflects not an absence of concern, but rather a belief that the responsibility for ethical production should be externalized. Failing to account for this negative WTP in aggregate welfare calculations would obscure preference heterogeneity and inflate estimated welfare gains from FAW improvements. This finding underscores the importance of integrating negative WTP and WTA in discrete choice and hybrid models, particularly when evaluating policies that aim to reconcile consumer behaviour with ethical or sustainability goals. Another approach for addressing negative WTP is to compute marginal rate of substitution instead of WTP (Oyinbo et al. 2019). However, this study did not adopt this approach.

In summary, the most valued attributes between Class 1 and Class 3 are the *outdoor access* (average €6.35), followed by *growth_rate_46_80* (average €5.45) and *space_8_9* (average €4.78), indicating a positive attitude towards all the main attributes related to AW. The HLCM highlights the importance of accounting for both preference and attitudinal heterogeneity in consumer behavior. The inclusion of attitudinal predictors improved class interpretability and confirmed that beliefs and personal values play a role in shaping market segments. While not all consumers are willing to pay more for higher FAW standards, a significant and clearly identifiable segment is, offering a strategic opportunity for product development and policy design aimed at facilitating ethical consumption.
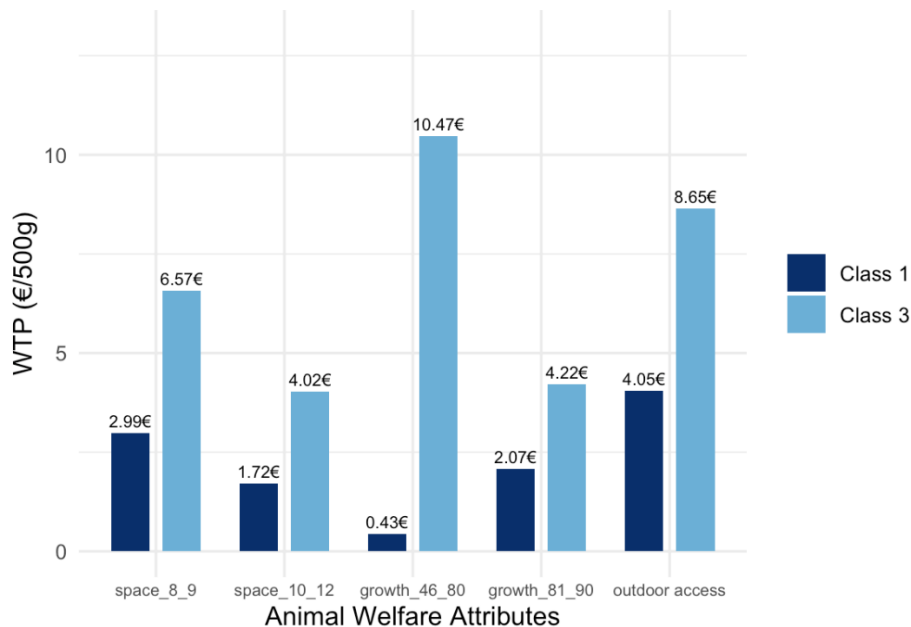

Figure 5. WTP by Attributes in the HLCM with Personal Values and Attitudes Towards FAW.
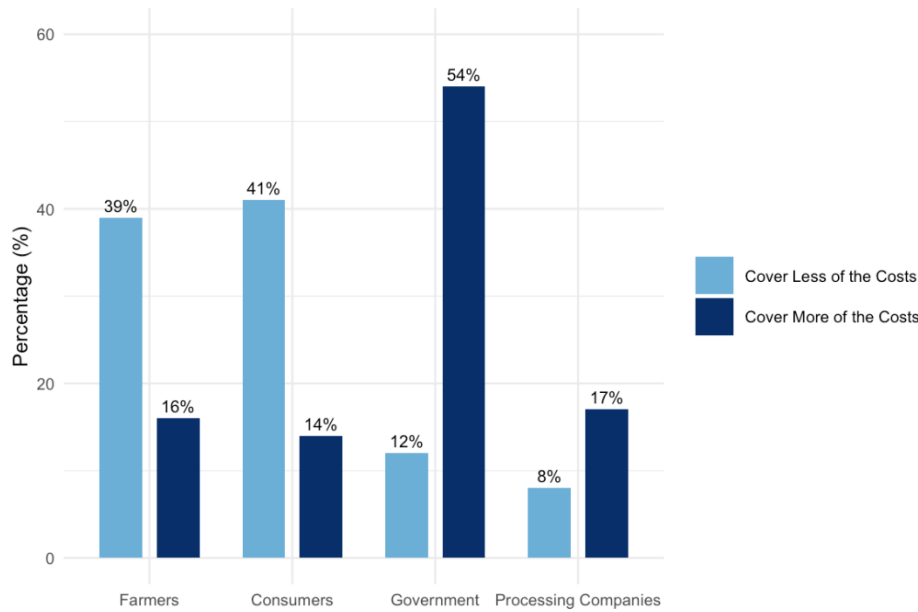
Figure 6. "In your opinion, who should bear the costs of transition from the conventional farming to one with higher FAW standards?"

5.3 Comparison with Previous Literature

The findings of this study largely confirm, and in some aspects expand upon, existing evidence in the literature on consumers' WTP for FAW. In line with founding about European consumers (Clark et al. 2017), this study shows a significant WTP for improvements in rearing conditions. Overall, the results from the HLCM analysis show that the estimated WTP values for "Welfare-oriented consumer" class are higher than those in the "Price-sensitive consumer" class, particularly for the attribute *growth_46_80* (€10.47) and the attribute *outdoor access* (€8.65). Conversely, consumer in class 1 shown a positive but modestly WTP (maximum 4,05€ for outdoor access), indicating a willingness to support welfare improvements only when the additional costs remain low. The comparison with Class 3 underlines a clear market segmentation, consistent with the findings of previous studies (Heinola et al. 2023; Cappone et al. 2025). Moreover, price-sensitive consumers slightly increase the average premium reported in international meta-analyses (Clark et al. 2017), raising it from around +30% to +39%. In contrast, welfare-oriented consumers exhibit a much higher premium, reaching approximately +119.91%, well above the international benchmarks.

However, this study also provides evidence of the well-documented *intention-behavior gap* (Sheeran & Webb 2016; Gross et al. 2021), exemplified by the large share of respondents belonging to a class that reports positive preferences for FAW attributes but a *positive* price coefficient (**"Passive-supporter consumers"** in the HLCM). This behavior reflects the "FAW supporters" profile previously described by Heinola et al. (2023) that ethically motivated consumers whose purchasing behavior does not consistently reflect their stated concerns. The observed divergence between expressed ethical concern and actual price sensitivity, confirms

the theoretical importance of the "citizen-consumer gap" discussed in ethical consumption literature (Schröder & McEachern 2004). This suggests that models of WTP for credence attributes may benefit from integrating dual-process theories of decision-making, which differentiate between intuitive moral responses and cost-based rational trade-offs.

The preference heterogeneity captured in the models emphasizes the existence of distinct consumer segments with varying ethical priorities and price sensitivity, in line with results of previous studies (Gorton et al. 2023; Schwickert 2023). In particular, the **"Welfare-oriented consumers"** class identified in this study exhibit coherent WTP values, consistent with the segment of "*committed ethical consumers*" and with those supporting official FAW-labeling schemes as described in previous studies (Nocella et al. 2010; Heinola et al. 2023).

More specifically within the Italian context, the findings are in line with previous studies (Rubini et al. 2021; Tiboldo et al. 2024; Cappone et al. 2025), highlighting positive WTP for higher-welfare attributes. Rubini et al. (2021) highlighted positive WTP for higher-welfare poultry, though their analysis did not account for heterogeneity. This study builds upon those foundations by revealing substantial variation in consumer preferences and the role of specific FAW attributes in driving choice, highlight the importance of the heterogeneity among consumers.

Tiboldo et al. (2024) underscore the importance of trust in certification schemes as a critical factor in enabling ethical purchasing. The presence in this study of a consumer segment that expresses ethical concern but rather prefers that someone else should bear the cost reinforces the idea that ethical awareness alone is insufficient, effective institutional tools are needed to reduce uncertainty and support consistent ethical choices.

Cappone et al. (2025) proposed a segmentation of Italian consumers based on moral values and environmental awareness, identifying a group of "*flexible ethical consumers*" who act consistently with their beliefs only when affordability or strong incentives are present. This group closely corresponds to **Passive-supporter consumers** in the current study, ethically aware yet economically constrained, further reinforcing the case for targeted demand-side interventions such as subsidies, information campaigns, and transparent labeling schemes.

5.4 Policy Implications and Market Recommendations

The findings highlight the need for targeted policy interventions and tailored market strategies to foster a more sustainable and welfare-oriented poultry sector. First, the study underscores the absence of tiered FAW labelling schemes that consumers can trust and use to effectively express their WTP. A well-designed system should include at least two distinct levels: a *basic level* aligned with the current minimum FAW standards, clearly communicated and affordable for price-sensitive consumers; and a *premium level* indicating higher welfare standards, designed for consumers who are strongly motivated by ethical considerations and willing to pay a higher price.

Second, there is space for public intervention. The transition from conventional farming systems to those with higher FAW standards requires financial support through government subsidies. These subsidies could help offset the increased production costs that would otherwise translate into higher retail prices, making welfare-friendly options more accessible, particularly for passive-supporter consumers. By reducing the financial barrier, policy measures can play a pivotal role in enabling more consumers to align their ethical concerns with their purchasing behavior.

Third, the role of retailers and processing companies must be acknowledged as essential in supporting the transition toward higher FAW standards. Food retailers act as key intermediaries between producers and consumers, actively shaping purchasing behavior through product placement, pricing strategies, and promotional efforts. By offering private-label products with certified FAW attributes, retailers can reduce market uncertainty and encourage investment on the supply side. At the same time, processing companies should commit to long-term procurement contracts with farmers, ensuring adequate remuneration to cover higher production costs. This would provide farmers with greater financial security and incentives to invest in improved welfare practices. Coordinated action along the value chain is therefore critical to ensure that consumer demand effectively translates into sustainable and scalable change.

5.5 Limitations of the Study

While the findings of this study offer valuable insights into consumer preferences and WTP for improved FAW, several limitations should be acknowledged. First, the use of a *stated preference approach*, through a hypothetical choice experiment, may have introduced hypothetical bias, leading respondents to overstate their actual WTP. Although efforts were made to minimize this bias through careful survey design and realistic product descriptions, the values reported may not fully reflect real-world behavior, particularly in the context of repeated or routine purchases. This concern is supported by previous literature, which suggests that in CE settings, WTP may be overstated by up to 3.2 times (Kanya et al. 2019).

Second, despite capturing key attitudinal variables, some potentially relevant latent factors, such as trust in food certifications or perceptions of product quality, were not included and could be explored in future research.

Third, the *sample was collected online* using convenience sampling methods, which may limit the external validity of the results. While the sample was demographically diverse, it does not necessarily represent the broader Italian population in terms of income distribution, regional differences, or cultural attitudes toward FAW. Furthermore, older or less digitally active segments may be underrepresented. Since the survey was distributed via social media without a defined sampling frame, it was not possible to calculate the *response rate*. This limits the ability to assess the extent of non-response bias, which could affect the representativeness of the sample and the reliability of the estimated WTP values. Future studies could address these limitations by employing more diverse sampling

strategies or by incorporating revealed preference data to validate the hypothetical choices made in the survey.

Another limitation concerns the short-term decision frame used in the survey: consumers were asked to make decisions based on a single purchase occasion. This may not capture how ethical preferences and price sensitivity evolve over time or under different economic conditions. Longitudinal studies or repeated choice tasks could help address this issue. Hence, future studies should study these consumers' behavior over time.

Finally, the scope of FAW attributes included in the experiment, while consistent with literature and policy priorities, was necessarily limited to a small number of key characteristics. Other relevant aspect, such as transport conditions or access to enrichment, were excluded to avoid cognitive overload. Future studies could consider a broader set of attributes or explore interactions between them, potentially through adaptive choice-based methods or hierarchical Bayes modeling.

Overall, while these limitations constrain the scope of the findings, they also highlight important avenues for future research. Incorporating a broader range of psychological variables would also enrich the segmentation and explanatory power of the models. Moreover, expanding data collection to reach less digitally active populations would ensure a more representative understanding of Italian consumers' preferences for animal welfare-friendly products.

6. Conclusion

This study provides new empirical insights into Italian consumers' WTP for poultry products produced under higher FAW standards. By combining choice modelling with attitudinal data, it reveals a heterogeneous consumer landscape shaped by both ethical concerns and economic constraints. While a significant segment is willing to financially support welfare improvements, others show inconsistent behavior, highlighting the persistent intention-behavior gap. These findings suggest that effective policy design and transparent labeling are key to transforming ethical concern into sustainable market demand.

References

Ajzen, I. (2002). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, 32 (4), 665–683. https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

Albrecht, D.M.G., Green, D.M., Hoffman, L., Albrecht, D.M.G., Green, D.M. & Hoffman, L. (2023). *Ethical Issues in Consumer Buying Behavior - Principles of Marketing | OpenStax*. https://openstax.org/books/principles-marketing/pages/3-4-ethical-issues-in-consumer-buying-behavior [2025-04-01]

Allender, W.J. & Richards, T.J. (2010). Consumer Impact of Animal Welfare Regulation in the California Poultry Industry.

Amato, M., Demartini, E., Gaviglio, A., Marescotti, M.E. & Verneau, F. (2023). Consumers' Preferences for Chicken Fed on Different Processed Animal Proteins: A Best–Worst Analysis in Italy. *Nutrients*, 15 (7), 1800. https://doi.org/10.3390/nu15071800

Animal welfare | EFSA (2023). https://www.efsa.europa.eu/en/topics/topic/animal-welfare [2025-02-17]

AVEC (2024). *Costs and implications of the European Chicken Commitment in the EU*. https://avec-poultry.eu/resources/cee_adas_study/ [2025-03-06]

Bahamonde-Birke, F.J. & Ortúzar, J. de D. (2021). How to categorize individuals on the basis of underlying attitudes? A discussion on latent variables, latent classes and hybrid choice models. *Transportmetrica A: Transport Science*, 17 (4), 856–877. https://doi.org/10.1080/23249935.2020.1817171

Balboni, V. (2024). I polli a crescita lenta in Italia sono pochi e costosi: e all'estero? *Il Fatto Alimentare*. https://ilfattoalimentare.it/polli-crescita-lenta-italia-estero.html [2025-03-25]

Banrie (2012). *Poultry Litter Management. The poultry site*. https://www.thepoultrysite.com/articles/poultry-litter-management [2025-04-07]

Bass, D.A., McFadden, B.R. & Messer, K.D. (2021). A case for measuring negative willingness to pay for consumer goods. *Food Policy*, 104, 102126. https://doi.org/10.1016/j.foodpol.2021.102126

Becker, G.S. (1976). *The Economic Approach to Human Behavior*. University of Chicago Press.

Bozzo, G., Barrasso, R., Grimaldi, C., Annarita, Tantillo, G. & Roma, R. (2019). Consumer attitudes towards animal welfare and their willingness to pay. *Veterinaria Italiana*,. https://doi.org/10.12834/VetIt.1823.9669.2

Broom, D.M. (2016). Considering animals' feelings: Précis of Sentience and animal welfare (Broom 2014). *Animal Sentience*, 1 (5). https://doi.org/10.51291/2377-7478.1015

Campbell, Y.L., Walker, L.L., Bartz, B.M., Eckberg, J.O. & Pullin, A.N. (2025). Outdoor access versus conventional broiler chicken production: Updated review of animal welfare, food safety, and meat quality. *Poultry Science*, 104 (4), 104906. https://doi.org/10.1016/j.psj.2025.104906

CAP 2023-27 - European Commission (2025). https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-2023-27_en [2025-02-24]

Cappone, E.E., Zambotto ,Valeria, Mota-Gutierrez ,Jatziri, Soglia ,Dominga, Daniele ,Giulia Maria, Cianciabella ,Marta, Pieroni ,Andrea, Soukand ,Renata, Penasa ,Mauro, Buccioni ,Arianna, Marzoni ,Margherita, Iaffaldano ,Nicolaia, Castellini ,Cesare, Cerolini ,Silvia, Forte ,Claudio & and Schiavone, A. (2025). Native Italian poultry products: the factors

influencing consumer perceptions. *Italian Journal of Animal Science*, 24 (1), 347–360. https://doi.org/10.1080/1828051X.2025.2453549

Cembalo, L., Caracciolo, F., Lombardi, A., Del Giudice, T., Grunert, K.G. & Cicia, G. (2016). Determinants of Individual Attitudes Toward Animal Welfare-Friendly Food Products. *Journal of Agricultural and Environmental Ethics*, 29 (2), 237–254. https://doi.org/10.1007/s10806-015-9598-z

Cicia, G. & Colantuoni, F. (2010). Willingness to Pay for Traceable Meat Attributes: A Meta-analysis. https://doi.org/10.18461/ijfsd.v1i3.138

Clark, B., Stewart, G.B., Panzone, L.A., Kyriazakis, I. & Frewer, L.J. (2017). Citizens, consumers and farm animal welfare: A meta-analysis of willingness-to-pay studies. *Food Policy*, 68, 112–127. https://doi.org/10.1016/j.foodpol.2017.01.006

European Regulation (CE) N. 1831/2003 (2003). . https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:02003R1831-20151230

EUROSTAT | Developments in organic farming (2024). https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Developments_in_organic_farming [2025-03-18]

Farm Animal Welfare Council, webmaster@defra gsi gov uk (2009). *FAWC - Farm Animal Welfare Council. Farm Animal Welfare Council*. [Istituzionale]. https://webarchive.nationalarchives.gov.uk/ukgwa/20121010012427mp_/http://www.fawc.org.uk/freedoms.htm [2025-02-17]

Ferguson, S.M., Wallenbeck, A., Agenäs, S. & Hansson, H. (2025). The Impact of Animal Welfare Regulations on Pork Trade: Evidence from European Countries. SSRN. https://doi.org/10.2139/ssrn.5061143

Fraser, D., Weary, D.M., Pajor, E.A. & Milligan, B.N. (1997). A Scientific Conception of Animal Welfare that Reflects Ethical Concerns. *Animal Welfare*, 6 (3), 187–205. https://doi.org/10.1017/S0962728600019795

Fuller, K., Grebitus, C. & Schmitz, T.G. (2022). The effects of values and information on the willingness to pay for sustainability credence attributes for coffee. *Agricultural Economics*, 53 (5), 775–791. https://doi.org/10.1111/agec.12706

Gao, Z. & Schroeder, T.C. (2009). Effects of Label Information on Consumer Willingness-to-Pay for Food Attributes. *American Journal of Agricultural Economics*, 91 (3), 795–809. https://doi.org/10.1111/j.1467-8276.2009.01259.x

Gaviglio, A., Pirani, A. & Demartini, E. (2012). IL VALORE AGGIUNTO DELL'ATTRIBUTO "BIOLOGICO" IL CASO DEI SALUMI

Gorton, M., Yeh, C.-H., Chatzopoulou, E., White, J., Tocco, B., Hubbard, C. & Hallam, F. (2023). Consumers' willingness to pay for an animal welfare food label. *Ecological Economics*, 209, 107852. https://doi.org/10.1016/j.ecolecon.2023.107852

Grebitus, C. & Van Loo, E.J. (2022). Relationship between cognitive and affective processes, and willingness to pay for pesticide-free and GMO-free labeling. *Agricultural Economics*, 53 (3), 407–421. https://doi.org/10.1111/agec.12701

Greene, W.H. & Hensher, D.A. (2003). A latent class model for discrete choice analysis: contrasts with mixed logit. *Transportation Research Part B: Methodological*, 37 (8), 681–698. https://doi.org/10.1016/S0191-2615(02)00046-2

Grethe, H. (2017). The Economics of Farm Animal Welfare. *Annual Review of Resource Economics*, 9 (1), 75–94. https://doi.org/10.1146/annurev-resource-100516-053419

Gross, S., Waldrop, M.E. & Roosen, J. (2021). How does animal welfare taste? Combining sensory and choice experiments to evaluate willingness to pay for animal welfare pork. *Food Quality and Preference*, 87, 104055. https://doi.org/10.1016/j.foodqual.2020.104055

Grunert, K.G. (2006). Future trends and consumer lifestyles with regard to meat consumption. *Meat Science*, 74 (1), 149–160. https://doi.org/10.1016/j.meatsci.2006.04.016

Grunert, K.G., Bech-Larsen, T. & Bredahl, L. (2000). Three issues in consumer quality perception and acceptance of dairy products. *International Dairy Journal*, 10 (8), 575–584. https://doi.org/10.1016/S0958-6946(00)00085-6

Grunert, K.G., Bredahl, L. & Brunsø, K. (2004). Consumer perception of meat quality and implications for product development in the meat sector—a review. *Meat Science*, 66 (2), 259–272. https://doi.org/10.1016/S0309-1740(03)00130-X

Guo, L., Zhao, B., Jia, Y., He, F. & Chen, W. (2022). Mitigation Strategies of Air Pollutants for Mechanical Ventilated Livestock and Poultry Housing—A Review. *Atmosphere*, 13 (3), 452. https://doi.org/10.3390/atmos13030452

Heinola, K., Latvala, T. & Niemi, J.K. (2023). Consumer trust and willingness to pay for establishing a market-based animal welfare assurance scheme for broiler chickens. *Poultry Science*, 102 (7), 102765. https://doi.org/10.1016/j.psj.2023.102765

Henningsen, A., Czekaj, T.G., Forkman, B., Lund, M. & Nielsen, A.S. (2018). The Relationship between Animal Welfare and Economic Performance at Farm Level: A Quantitative Study of Danish Pig Producers. *Journal of Agricultural Economics*, 69 (1), 142–162. https://doi.org/10.1111/1477-9552.12228

Hensher, D.A. & Greene, W.H. (2003). The Mixed Logit model: The state of practice.

Jang, H.-W. & Cho, M. (2022). Relationship between Personal Values and Intentions to Purchase Plant-Based Meat Alternatives: Application of the Dual Concern Theory. *International Journal of Environmental Research and Public Health*, 19 (14), 8673. https://doi.org/10.3390/ijerph19148673

Jassel, A. (2024). *The Economics of Animal Welfare and Its Impact on Meat Prices - HusFarm. Husfarm Agriculture platform*. https://husfarm.com/article/the-economics-of-animal-welfare-and-its-impact-on-meat-prices [2025-02-17]

Kanya, L., Sanghera, S., Lewin, A. & Fox-Rushby, J. (2019). The criterion validity of willingness to pay methods: A systematic review and meta-analysis of the evidence. *Social Science & Medicine*, 232, 238–261. https://doi.org/10.1016/j.socscimed.2019.04.015

Kehlbacher, A., Bennett, R. & Balcombe, K. (2012). Measuring the consumer benefits of improving farm animal welfare to inform welfare labelling. *Food Policy*, 37 (6), 627–633. https://doi.org/10.1016/j.foodpol.2012.07.002

Lagerkvist, C.J. & Hess, S. (2011). A meta-analysis of consumer willingness to pay for farm animal welfare. *European Review of Agricultural Economics*, 38 (1), 55–78. https://doi.org/10.1093/erae/jbq043

Lancaster, K.J. (1966). A New Approach to Consumer Theory. *The Journal of Political Economy*, 74 (2), 132–157

Lena, J. (2016). Acceptance of Animal Husbandry Practices: The Consumer Perspective.

Loo, E.J.V., Caputo, V., Jr, R.M.N., Meullenet, J.-F. & Ricke, S.C. (2011). Consumers' willingness to pay for organic chicken breast: Evidence from choice experiment.

Lorelei, M.M., Anders, S. & Wismer, W.V. (2011). Consumer Preferences and Willingness to Pay for Value-Added Chicken Product Attributes. *Journal of Food Science*, 76 (8), S469–S477. https://doi.org/10.1111/j.1750-3841.2011.02354.x

Lund, V., Coleman, G., Gunnarsson, S., Appleby, M.C. & Karkinen, K. (2006). Animal welfare science—Working at the interface between the natural and social sciences. *Applied Animal Behaviour Science*, 97 (1), 37–49. https://doi.org/10.1016/j.applanim.2005.11.017

Mariel, P., Artabe, A., Liebe, U. & Meyerhoff, J. (2024). An assessment of the current use of hybrid choice models in environmental economics, and considerations for future applications. *Journal of Choice Modelling*, 53, 100520. https://doi.org/10.1016/j.jocm.2024.100520

Martelli, G. (2009). Consumers' perception of farm animal welfare: an Italian and European perspective. *Italian Journal of Animal Science*, 8 (sup1), 31–41. https://doi.org/10.4081/ijas.2009.s1.31

Meluzzi, A., Fabbri, C., Folegatti, E. & Sirri, F. (2008). Survey of chicken rearing conditions in Italy: effects of litter quality and stocking density on productivity, foot dermatitis and carcase injuries. *British Poultry Science*, 49 (3), 257–264. https://doi.org/10.1080/00071660802094156

Miller, D. (2001). *Consumption: Disciplinary approaches to consumption*. Taylor & Francis.

Molitorisová, A. & Burke, C. (2023). Farm to fork strategy: Animal welfare, EU trade policy, and public participation. *Applied Economic Perspectives and Policy*, 45 (2), 881–910. https://doi.org/10.1002/aepp.13326

Napolitano, F., Girolami, A. & Braghieri, A. (2010). Consumer liking and willingness to pay for high welfare animal-based products. *Trends in Food Science & Technology*, 21 (11), 537–543. https://doi.org/10.1016/j.tifs.2010.07.012

Nocella, G., Hubbard, L. & Scarpa, R. (2010). Farm Animal Welfare, Consumer Willingness to Pay, and Trust: Results of a Cross-National Survey. *Applied Economic Perspectives and Policy*, 32 (2), 275–297. https://doi.org/10.1093/aepp/ppp009

Oh, S.E. & Vukina, T. (2022). The price of cage-free eggs: Social cost of P roposition 12 in CALIFORNIA. *American Journal of Agricultural Economics*, 104 (4), 1293–1326. https://doi.org/10.1111/ajae.12279

Oppenheimer, J.A. (2008). Rational Choice Theory.

Owusu-Sekyere, E., Hansson, H. & Telezhenko, E. (2022). Use and non-use values to explain farmers' motivation for the provision of animal welfare. *European Review of Agricultural Economics*, 49 (2), 499–525. https://doi.org/10.1093/erae/jbab012

Oyinbo, O., Chamberlin, J., Vanlauwe, B., Vranken, L., Kamara, Y.A., Craufurd, P. & Maertens, M. (2019). Farmers' preferences for high-input agriculture supported by site-specific extension services: Evidence from a choice experiment in Nigeria. *Agricultural Systems*, 173, 12–26. https://doi.org/10.1016/j.agsy.2019.02.003

Purvis, B., Mao, Y. & Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability Science*, 14 (3), 681–695. https://doi.org/10.1007/s11625-018-0627-5

Rold, C.D. (2023). Blog | Ora sappiamo quanti antibiotici vengono usati davvero negli allevamenti italiani. *Info Data*. https://www.infodata.ilsole24ore.com/2023/04/18/ora-sappiamo-quanti-antibiotici-vengono-usati-davvero-negli-allevamenti-italiani/ [2025-03-07]

Rubini, G., Nannoni, E., Di Pasquale, J., Martelli, G. & Sardi, L. (2021). Update on animal welfare perception by Italian consumers: A descriptive survey.

Italian Journal of Food Safety, 10 (3), 9588.
https://doi.org/10.4081/ijfs.2021.9588

Schröder, M.J.A. & McEachern, M.G. (2004). Consumer value conflicts surrounding ethical food purchase decisions: a focus on animal welfare. *International Journal of Consumer Studies*, 28 (2), 168–177. https://doi.org/10.1111/j.1470-6431.2003.00357.x

Schwickert, H. (2023). Paying for animal welfare labelling no matter what? A discrete choice experiment. *European Review of Agricultural Economics*, 50 (5), 1754–1795. https://doi.org/10.1093/erae/jbad027

Sheeran, P. & Webb, T.L. (2016). The Intention–Behavior Gap. *Social and Personality Psychology Compass*, 10 (9), 503–518. https://doi.org/10.1111/spc3.12265

Squires, L., Juric, B. & Bettina Cornwell, T. (2001). Level of market development and intensity of organic food consumption: cross-cultural study of Danish and New Zealand consumers. *Journal of Consumer Marketing*, 18 (5), 392–409. https://doi.org/10.1108/07363760110398754

Stankevich, A. (2017). Explaining the Consumer Decision-Making Process: Critical Literature Review. *JOURNAL OF INTERNATIONAL BUSINESS RESEARCH AND MARKETING*, 2 (6), 7–14. https://doi.org/10.18775/jibrm.1849-8558.2015.26.3001

Staples, A.J., Lusk, J.L., Caputo, V. & Tonsor, G.T. (2025). Farm Animal Welfare and Producer Profitability. *Journal of Agricultural and Applied Economics*, 57 (1), 182–197. https://doi.org/10.1017/aae.2024.40

Tiboldo, G., Casolani, N., Reguzzi, M.C., Cominelli, F., Coderoni, S., Arata, L. & Mazzoni, E. (2024). Factors influencing Italian consumers' willingness to buy and pay for insect-fed poultry products. https://doi.org/10.1163/23524588-00001041

Train, K.E. (2009). *Discrete Choice Methods with Simulation*. Cambridge University Press.

Van Der Eijk, J.A.J., Van Harn, J., Gunnink, H., Van Hattum, T., Wolthuis-Fillerup, M., Melis, S., Te Beest, D.E. & De Jong, I.C. (2025). Growth rate, either through genetics or diet, mainly determines the outcome concerning broiler welfare. *animal*, 19 (3), 101431. https://doi.org/10.1016/j.animal.2025.101431

Varian, H. (2014). *Intermediate Microeconomics with Calculus: A Modern Approach: International Student Edition*. W. W. Norton & Company.

Veissier, I., Butterworth, A., Bock, B. & Roe, E. (2008). European approaches to ensure good animal welfare.

Yang, Y.-C. & Hong, C.-Y. (2019). Taiwanese Consumers' Willingness to Pay for Broiler Welfare Improvement. *Animals*, 9 (5), 231. https://doi.org/10.3390/ani9050231

Popular science summary

Consumers increasingly care about the way animals are treated on farms. But do these ethical concerns influence what people buy, especially when price is involved? This thesis explores how Italian consumers respond to chicken products with different levels of animal welfare, such as lower stocking density, slower growth, and access to the outdoors. Through an online survey and a series of product choice scenarios, the study finds that most consumers do value animal welfare and are willing to pay more for better treatment of chickens. However, people are not all the same: some are strongly motivated by ethical concerns, others care but do not always act on it, and some are mainly focused on price. To make high-welfare options more accessible, the research suggests clearer animal welfare labelling, a wider range of affordable products, and government support for farmers. Retailers and food companies can also help by promoting these products and supporting better farming practices. In short, making ethical food choices easier and more affordable could lead to real improvements in animal welfare, without putting the burden only on the consumer.

Appendix 1

Table A1. Personal Value for Explaining Consumer Choices (1).

Statement	Response scale
Ensuring a high level of animal welfare in farming gives me a sense of personal satisfaction. I feel very happy with myself when I support initiatives that improve farm animal welfare. It is very important that animals raised for food production are treated ethically and respectfully. I believe that farmers should provide animals with adequate living conditions, even if this increases production costs. It is essential for me to choose food products that respect animal welfare.	Level 1: Strongly disagree Level 2: Disagree Level 3: Somewhat agree Level 4: Agree Level 5: Strongly agree

Table A2. Personal Value for Explaining Consumer Choices (2).

Statement	Response scale
Overcrowding of animals in conventional farming systems. The conditions in which animals are transported to be slaughtered. The use of antibiotics and other medications in livestock farming. The level of stress and suffering experienced by animals in conventional farming. The lack of outdoor access for farm animals. Slaughter conditions and their compliance with animal welfare standards. Compliance with animal welfare regulations in farms. The environmental impact of conventional livestock farming.	Level 1: Not concerned at all Level 2: Not concerned Level 3: Somewhat concerned Level 4: Concerned Level 5: Very concerned

	Strongly disagree	Disagree	Somewhat agree	Agree	Strongly agree
Ensuring a high level of animal welfare in farming gives me a sense of personal satisfaction.	◯	◯	◯	◯	◯
I feel very happy with myself when I support initiatives that improve farm animal welfare.	◯	◯	◯	◯	◯
It is very important that animals raised for food production are treated ethically and respectfully.	◯	◯	◯	◯	◯
I believe that farmers should provide animals with adequate living conditions, even if this increases production costs.	◯	◯	◯	◯	◯
It is essential for me to choose food products that respect animal welfare.	◯	◯	◯	◯	◯

Figure A1. Example of Likert-Scale Questions Used in the Attitudinal Section of the Survey.

Appendix 2 - Conditional Logit (CL) for Testing Homogeneity Assumption

A CL Model was estimated to test the assumption of preference homogeneity among respondents. The model achieved a final log-likelihood of -1829.22. All coefficients are statistically significant at the 1% level, with signs consistent with economic theory. The coefficient for price is negative (-0.069), confirming that respondents derive lower utility from more expensive options. All FAW attributes display positive and significant coefficients, suggesting that improvements in farming conditions are generally valued. The highest utility gain is associated with *outdoor access* (1.00), followed by *space_8_9* (0.98). Consequently, the attribute with the highest odds ratio is *outdoor access* (2.74), indicating that products offering this feature are 2.74 times more likely to be chosen compared to those without it, holding other factors constant. Price has a negative effect on the probability of choice. However, the impact appears relatively moderate, indicating a moderate price elasticity for this product category. The Pseudo R^2 value of 0.2248 suggests that, although the model explains part of the variance in preferences, it does not fully capture their complexity. This supports the adoption of models that explicitly account for preference heterogeneity.

Table A3. CL Model for Testing Homogeneity Assumption.

Choice	Coeff.	Std. Err.	z	P>|z|	Odds Ratio
Price	-0.068989	0.0103731	-6.65	0.00	0.93
Space_8_9	0.978516	0.0634346	15.43	0.00	2.66
Space_10_12	0.848469	0.1367757	6.20	0.00	2.34
Growth_46_80	0.859248	0.09671	8.88	0.00	2.36
Growth_81_90	0.479579	0.0684077	7.01	0.00	1.62
Outdoor access	1.008304	0.0565023	17.85	0.00	2.74
Log likelihood	-1829.2156				
Pseudo R2	0.2248				

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