

## Review

# Navigating moral landscape: Islamic ethical choices and sustainability in Halal meat production and consumption

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Received: 19 December 2023 / Accepted: 26 July 2024

Published online: 31 August 2024

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## Abstract

This systematic review explores ethical considerations and sustainability practices within the Halal meat industry, analyzing Islamic ethical decisions, consumer behavior, and industry practices. It begins by examining the moral foundations of Halal meat production, focusing on principles of animal welfare, ethical handling, and halalan tayyiban (wholesomeness). The review highlights the role of Halal certification in ensuring good animal husbandry and maintaining Halal integrity throughout the supply chain. It then delves into the ethical practices in Halal slaughter and processing, emphasizing adherence to Shariah law, religious cleanliness, and consumer trust through transparency and traceability. The use of specific rules, cutting-edge technologies, and ethical considerations for ensuring animal welfare and ethical treatment are also discussed. The study concludes by highlighting the interplay between ethical considerations and sustainability, emphasizing the importance of legal frameworks for sustainable Halal meat production. The findings contribute to understanding how ethical practices, combined with sustainability, shape a responsible and conscientious Halal meat industry.

**Keywords** Halal meat · Ethical considerations · Islamic dietary laws · Animal welfare · Sustainability

## 1 Introduction

The global Halal food market is expected to experience significant expansion in the coming years. It underscores a market size that is forecast to more than double from USD 2339.1 billion in 2023 to USD 5643.30 billion by 2030, propelled by a healthy 10.5% CAGR. Regionally, Asia is the epicenter of this market, claiming a 59% share in 2023, indicating both the region's large consumer base and its growing economic influence. Europe also holds a significant portion, with 21%, while other regions like North America, the Middle East, Africa, and South America are also key players but with smaller slices of the market. Industry-wise, the Halal food sector is the juggernaut, occupying a 40% market share, with other industries such as pharmaceuticals, tourism, clothing, cosmetics, and media also being substantial contributors to the Halal market ecosystem. The Halal food market is categorized into various segments, including cereals and grains, fruits and vegetables, milk and dairy products, meat and poultry, and seafood. In 2023, the meat segment dominated the Halal Food market with a market share of 7% [1]. The global Halal meat market, valued at USD 810.4 billion in 2022, is on a strong growth trajectory. Forecasts predict the market will expand to reach USD 1,657.44 billion by 2031, progressing at a compound annual growth rate (CAGR) of 7.4% during the period from 2023 to 2031 [2, 3]. Thus, Fig. 1 illustrates the

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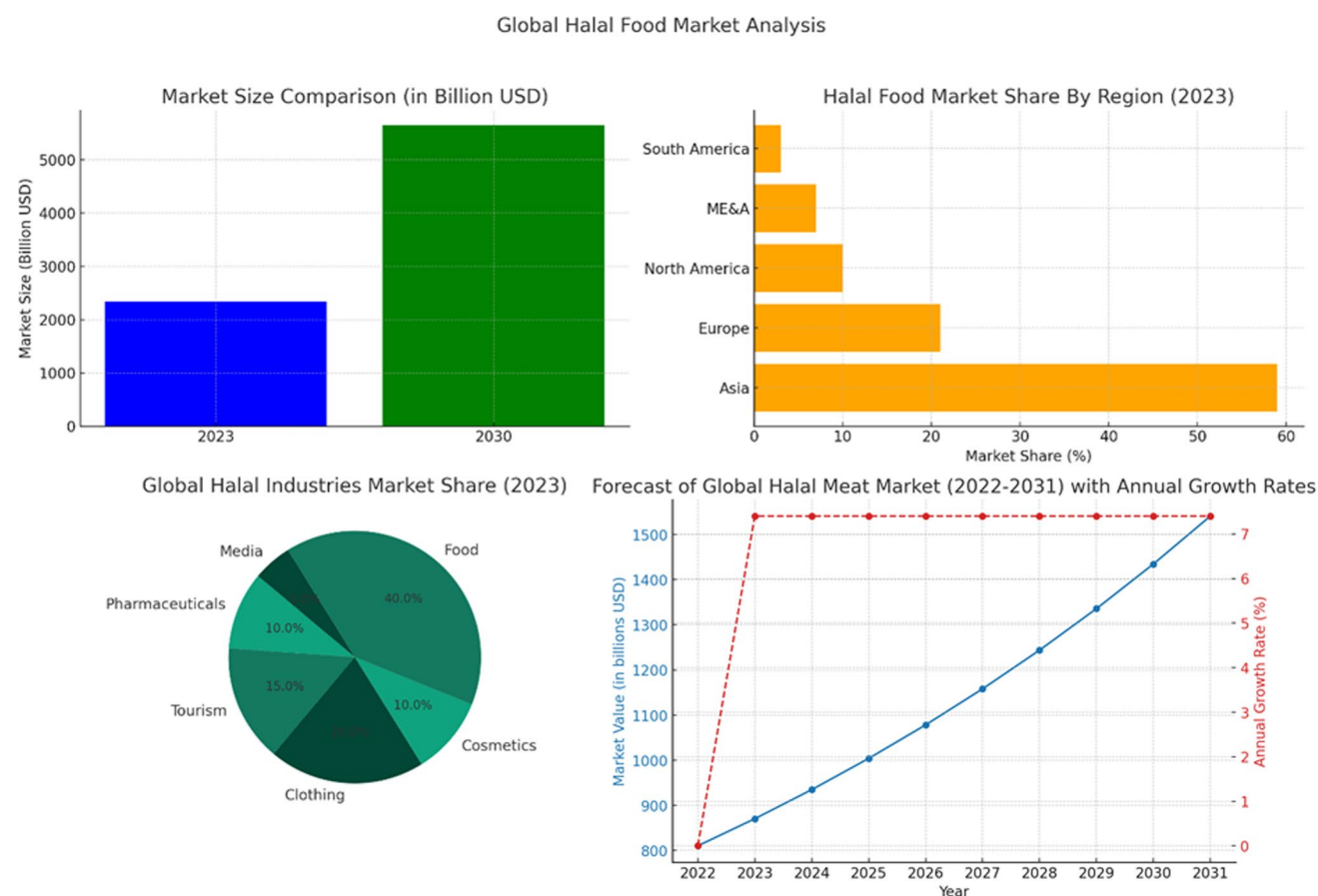
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current distribution of the global Halal market across various regions and industries, emphasizing the dominant share of the food sector, particularly Halal meat, with annual growth rates.

The global Halal meat market is driven by the increasing demand among the growing Muslim population, which views Halal consumption as a matter of religious obligation and a way to maintain good health. With over two billion Muslims globally, particularly concentrated in regions like the Middle East, Asia-Pacific, and Africa, the market for Halal meat continues to expand, presenting significant growth opportunities. Asia-Pacific leads the market share in Halal meat production, particularly in Southeast Asia, where countries like Indonesia and Malaysia, with their large Muslim populations, are key contributors to market growth. These countries are expected to remain dominant in the forecast period [2]. The rise of this phenomenon can be attributed primarily to the dietary choices of a growing global Muslim population, which is projected to make up approximately 30% of the world's population by the middle of the twenty-first century [4]. The dynamic market of the Halal meat industry underscores the increasing global relevance and economic potential of Halal meat products. Interestingly, the appeal of Halal meat transcends religious boundaries, captivating individuals who do not identify as Muslims but are attracted to its perceived higher quality in terms of safety and hygiene. This phenomenon contributes to the growing global demand for Halal meat. The Halal industry's rapid evolution can be attributed to several factors, including demographic shifts, globalization, and the increasing awareness of Islamic principles and values [5].

The ethical implications pertaining to the production and consumption of Halal meat have gained substantial importance in light of the ongoing expansion of the industry. The integration of a critical narrative has become inherent to the framework of Halal meat production and consumption. The importance of aligning business practices with Islamic norms and ethics has become increasingly prominent in recent years [6]. The period that has followed the COVID-19 outbreak, known as the post-pandemic period, has resulted in a fundamental change in consumer behavior. The pandemic has prompted a notable shift in consumer psychology, influencing purchasing behaviors and necessitating the adaptation of business models to accommodate these changes [7]. The emphasis on integrating Islamic norms and ethics into business practices has become more significant, particularly in the aftermath of the COVID-19 pandemic, which has fundamentally



**Fig. 1** Overview of the global Halal market distribution and projections of Halal meat market growth

altered consumer behavior. According to [8], ethical standards significantly influence current consumption patterns of *tayyib* and Halal food. This transition underscores the important role of integrating Islamic ethics across the Halal meat supply chain, which may play an essential role in enhancing sustainability, transparency, and accountability [9]. This change has had a notable influence on the preferences of consumers, specifically in relation to their inclination towards sustainable practices and healthier choices.

The concept of sustainability can be defined from four distinct yet interrelated perspectives: (1) as a collection of social-ecological criteria that direct human behavior; (2) as a vision that is realized through the alignment of social and ecological objectives within a particular system; (3) as a tangible outcome or phenomenon that occurs within social-ecological systems; and (4) as an approach that incorporates social and ecological factors into the analysis of activities, processes, or products [10]. This multifaceted definition underscores sustainability's comprehensive nature, emphasizing the importance of considering both social and ecological dimensions in creating sustainable human endeavors. Sustainability in the context of Halal meat production and consumption refers to the ability to meet the current industry's needs without compromising the ability of future generations to meet their own, ensuring a balance between economic growth, environmental protection, animal welfare, and social equity. This encompasses the responsible management of resources, adherence to ethical welfare standards for animals, minimizing environmental footprints, and ethical consideration for social well-being and supply chain integrity with consumer protection and traceability. Therefore, as the Halal meat market expands, sustainability practices and ethical considerations within this industry have gained significant importance. Ethical considerations include ensuring humane treatment of animals, transparent labeling, and certification processes, as well as fair treatment of workers and adherence to Islamic principles throughout the supply chain. Upholding these ethical standards is crucial for building trust among consumers and promoting the long-term sustainability of the Halal meat industry.

This article embarks on a comprehensive exploration of the intersecting realms of ethical considerations and sustainability practices within the Halal meat industry. Through a meticulous examination, the article aspires to offer more than just a snapshot; it seeks to provide a panoramic view of how ethical choices resonate within the industry, shaping the behavior of its stakeholders. By navigating the multifaceted dimensions inherent in both ethical decision-making and sustainability practices, the article aims to unravel the interconnectedness of these elements. In doing so, it endeavors to illuminate not only the immediate impact on the industry but also the enduring effects on the environment, societal dynamics, and the overarching ethos of responsible and conscientious practices within the Halal meat sector. To navigate this landscape, this article explores ethical labeling, sustainability certifications, and Islamic dietary principles, aiming to provide a comprehensive view of how these factors influence Halal meat production and consumption. It presents the alignment of Halal certification's moral foundations with the global imperative for sustainable food production. It offers insights into the ethical and environmental dimensions of the Halal meat supply chain and the legal and traceability concerns contributing to sustainable development goals. The current article provides a foundation for further exploration in this evolving field, addressing a gap in existing literature and paving the way for future studies on the subject.

## 1.1 Defining key terms

Before proceeding further, we define several key terms essential to understanding the discussions presented in this article.

### 1.1.1 Moral

This term refers to the principles of right and wrong behavior that guide individuals and societies. Morality can be influenced by various factors, including religious, philosophical, and cultural beliefs. It's a concept that extends beyond any single set of teachings to encompass a universal set of ethical standards.

### 1.1.2 Cultural

This encompasses the shared practices, beliefs, and values that characterize different groups or societies. Culture shapes how people perceive and interact with the world around them, influencing a wide range of activities, from food consumption to social norms.

### 1.1.3 Sustainability

Sustainability refers to the balance between environmental health, social equity, and economic viability. Sustainable practices are those that meet the needs of the present without compromising the ability of future generations to meet their own needs.

#### 1.1.4 Halalan Tayyiban

Halalan Tayyiban refers to the Islamic concept of food being not only permissible (Halal) but also wholesome (Tayyib).

#### 1.1.5 Animal welfare

Animal welfare concerns the treatment and well-being of animals. It involves ensuring that animals are treated humanely, with consideration for their physical and psychological health, throughout all stages of their lives.

#### 1.1.6 Traceability

The ability to track the origin and history of a product through its entire production and distribution process.

#### 1.1.7 Halal certification

The process by which products are verified to comply with Islamic law allows them to be deemed permissible for consumption.

#### 1.1.8 Ethical labelling

Designates products as meeting specific ethical criteria in their production and trade.

#### 1.1.9 Sustainability certifications

Third-party assessments verify adherence to standards related to environmental, social, and economic sustainability.

## 1.2 Literature review

Islamic dietary laws, more commonly known as Halal, extend far beyond mere food permissibility, embodying a comprehensive system of values that integrate moral, ethical, and social principles. In Ref. [11] expands this notion by articulating how Islamic food ethics transcend religious discussions on dietary restrictions to embrace a concept of food justice. This broader perspective weaves together religious mandates with ethical and political considerations, advocating for a thoughtful and ethical approach to consumption that resonates with contemporary interpretations of religious devotion. Moreover, Halal certification emerges as a pivotal element in this discourse, serving not only as a marker of compliance with Islamic laws but also as a means to ensure food safety, uphold quality standards, foster market trust, and enhance consumer protection [12].

The exploration of ethical considerations and sustainability practices within the Halal meat industry necessitates a nuanced understanding of the moral, cultural, and sustainability frameworks that underpin these discussions. At the outset, it is crucial to delineate these core concepts, as they shape the contours of Islamic ethical choices, consumer dynamics, and industry practices in the context of Halal meat production and consumption.

Moral considerations in Halal meat production are rooted in Islamic ethics [9, 13]. This ethical framework emphasizes the humane and respectful treatment of animals, ensuring their welfare throughout the production process, and adhering to Islamic slaughtering practices in Halal meat production. Such practices are not merely procedural but are imbued with deep religious and moral significance, aiming to minimize suffering and ensure the dignity of the creatures under Islamic care.

To address the needs of their communities, businesses are increasingly required to go beyond their traditional job of providing goods and services [14]. Cultural aspects are equally pivotal, reflecting the practices, beliefs, and

values that define the Muslim community's engagement. The early Muslim jurisprudence exhibits significant cultural diversity, leading to various expressions of Islamic cultural phenomena within different communities across the Islamic globe. This diversity is founded upon a universally accepted set of beliefs and ethical guidelines while also encompassing regional customs and rituals, provided they do not contradict Islamic principles [15]. Furthermore, cultural dimensions extend beyond religious adherence, influencing consumer behavior and preferences across different regions and contexts. The global appeal of Halal meat, transcending religious boundaries, underscores the intersection of culture, identity, and ethical consumption.

[6]'s investigation into the potential benefits of Halal cultivated meat serves as a cornerstone, establishing a connection between economic prosperity in the Halal economy and the imperative of environmental sustainability. This study aligns Islamic teachings with principles that advocate for sustainable practices in Halal meat production. [16]'s research further enriches this understanding by delving into ethical questions surrounding Halal meat production. It emphasizes the intricate relationship between ethical considerations and the technical dimensions of sustainability, contributing valuable insights to the broader discourse on sustainable practices in the Halal meat industry.

Another significant aspect of the literature review explores the role of stringent regulations on animal rearing and slaughter, as emphasized by the Halal Certification Services (2023). This section underscores how these regulations not only mitigate environmental impact but also foster sustainable food production, thereby influencing consumer preferences for Halal meat. Previous study also offers a detailed examination of consumer behavior dynamics, unraveling the influences of self-determination needs, religiosity, and specific features of Halal-organic meat on purchasing decisions. This provides a nuanced understanding of the ethical considerations shaping consumer choices within the Halal meat market.

Revisiting [16]'s work, the literature review underscores the examination of the ethical shift brought about by Halal certification. This exploration delves into the entanglement of sustainable capitalism with labor conditions and environmental considerations, shedding light on the evolving ethical notions within the Halal meat industry. Additionally, [17] underline the critical relationship between Halal meat production's sustainability challenges and environmental concerns, urging for sustainable industry practices. This emphasizes the necessity for halal food supply chains to adopt measures that not only comply with Islamic dietary laws but also promote environmental sustainability. Addressing these challenges involves enhancing halal processes, adopting quality management systems, and integrating technology to improve economic performance while ensuring environmental protection and social responsibility within the halal food industry. Collectively, these studies contribute to a comprehensive overview, enriching our understanding of the intricate interplay between Islamic ethical choices and sustainability in Halal meat production and consumption.

### 1.3 Research questions and objectives

The research questions and objectives emanate from the identified gaps and insights in the literature:

Research Question 1: How do Islamic ethical choices, particularly those related to the moral foundations, principles, and values in Halal slaughter and processing, impact the sustainability of Halal meat production across different regions and contexts?

Research Objective 1: Systematically review and analyze the impact of Islamic ethical choices on the sustainability of Halal meat production.

Research Question 2: What roles do moral, cultural, and sustainability considerations, particularly in ethical labeling, sourcing, and certification, as well as consumer attitudes and behaviors related to the Islamic ethic with dietary laws, play in shaping consumers' preferences for Halal meat?

Research Objective 2: Conduct a comprehensive review of studies exploring the influence of moral, cultural, and sustainability considerations on consumers' preferences for Halal meat.

Research Question 3: What ethical considerations and sustainability practices are implemented within the Halal meat industry, and how do these practices collectively contribute to the overall sustainability and ethical standing of the industry?

Research Objective 3: Systematically examine the ethical considerations and sustainability practices implemented within the Halal meat industry through a review of existing literature, aiming to provide a comprehensive understanding of their collective impact on industry sustainability.

Following the outlined RQs and ROs, this study aims to address three key gaps:

1. **Depth of Islamic Ethical Impact:** Despite the recognition of Islamic ethics in Halal meat production, the depth of its impact on sustainability across diverse regions remains underexplored.
2. **Consumer Behavior Insights:** The intricate influences of moral, cultural, and sustainability considerations on consumer preferences for Halal meat lack comprehensive understanding.
3. **Industry Practices Overview:** While certain ethical and sustainability practices are known within the Halal meat industry, a holistic view of these practices' collective contribution to industry sustainability and ethics is scarce.

By systematically examining these areas, our research seeks to enrich the academic and practical understanding of the Halal meat industry's ethical and sustainability dynamics.

## 2 Methodology

In this systematic review, we follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, conducting a comprehensive analysis of existing articles relevant to the research question. Adhering to predefined inclusion and exclusion criteria, our aim is to synthesize findings on "Halal meat," with a specific emphasis on ethical considerations and sustainability in both production and consumption. Our methodology, outlined in Fig. 2, ensures transparency and minimizes bias in the study selection process. The decision to focus on ethics in Halal meat production and consumption aligns with the contemporary discourse on sustainability in food production, encompassing environmental impact, ethical treatment of animals, and socio-cultural considerations. Acknowledging the integral connection between ethical choices and sustainability, we explore how Islamic ethical decisions influence the sustainability

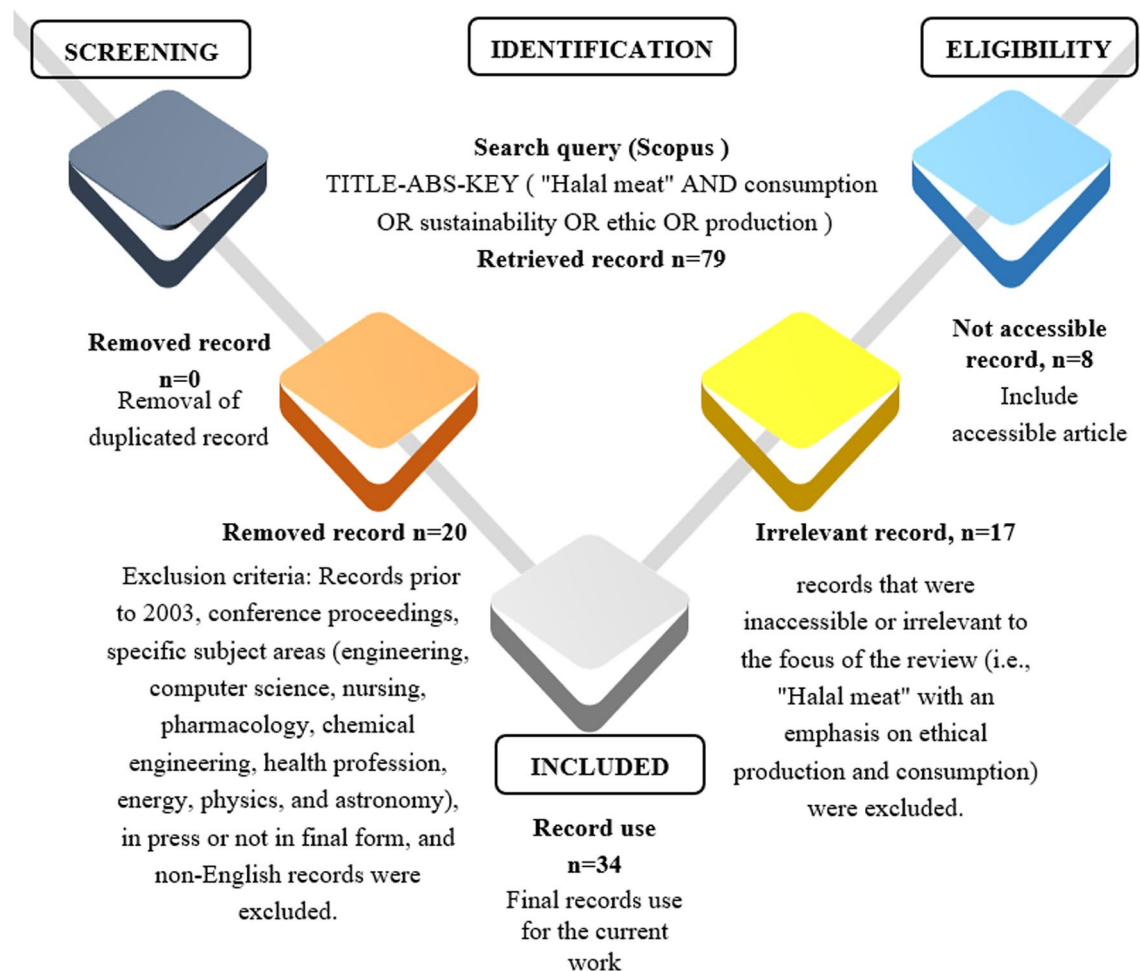


Fig. 2 Flow diagram of the PRISMA study



of Halal meat production, evaluating both adherence to ethical principles in production and the broader implications for industry sustainability. This systematic approach, guided by PRISMA, provides a standardized and reproducible method for navigating the ethical concerns of the Halal meat industry. As we delve into the intricate connections between Islamic ethics, sustainability, and consumer choices, our systematic review seeks to contribute to a nuanced understanding of the ethical dimensions shaping the Halal meat industry.

## 2.1 Initial investigation

At the outset of this systematic review, we conducted an in-depth initial investigation by formulating a meticulous search query utilizing specific keywords related to “Halal meat,” with a pronounced emphasis on consumption, ethics, production, and sustainability. The search query was thoughtfully crafted to ensure the retrieval of articles that not only address the ethical dimensions of Halal meat but also encompass its broader implications for sustainability within the industry. Recognizing the contemporary importance of sustainability in food production, our search criteria were designed to capture studies that explore the environmental impact, ethical treatment of animals, and socio-cultural considerations associated with Halal meat. This deliberate approach ensures that our review not only comprehensively covers the ethical aspects of Halal meat consumption and production but also delves into the critical issue of sustainability, examining how ethical choices within the industry contribute to its overall ecological and social sustainability.

## 2.2 Identification

The initial phase involves identification, a crucial step in the research process. Here, we systematically seek synonyms, related terms, and variations for the core keywords employed in this study, namely “Halal meat,” “consumption,” “sustainability,” “ethics,” and “production.” Enriching our keyword pool is achieved through the utilization of the thesaurus, the integration of keywords from prior studies, and recommendations from Scopus. Keywords were identified through a systematic process designed to ensure comprehensive coverage of our research topic. Initially, we conducted a preliminary review of existing literature on Halal meat production, Islamic dietary laws, ethics and sustainability practices to identify common and relevant terms used in these areas. This initial exploration helped in forming a base list of keywords. We also considered the use of Boolean operators (AND, OR, NOT) to combine keywords effectively, allowing for a more targeted search that could include multiple aspects of our research topic simultaneously. Once the keywords are identified, we construct a comprehensive search string, as illustrated in Fig. 2. The search string is meticulously developed by amalgamating all synonyms associated with each keyword, ensuring precision in our searches by eliminating terms that do not contribute to forming effective search strings across the database. The importance of accurate keyword selection cannot be overstated, as it profoundly impacts the efficacy of the article search. This initial identification step yielded a total of 79 records from the Scopus databases.

## 2.3 Screening

In this stage, the retrieved records underwent a screening process. The aim was to remove any duplicates, as well as records that were deemed irrelevant. The screening process for this study resulted in 79 unique records from the Scopus databases. No records were removed during the screening process as the single-source database was used. Thus, the retrieved records include articles and research papers that discuss various aspects of Halal meat consumption, production, and sustainability.

## 2.4 Exclusion criteria

In order to ensure the precision and relevance of the review, a set of well-defined exclusion criteria was systematically applied to the records under consideration. These criteria were meticulously designed to filter out records that did not align with the specific requirements of the review. This encompassed the exclusion of records falling into the following categories: those published prior to 2003, conference proceedings or notes, records originating from distinct subject areas such as engineering, computer science, nursing, pharmacology, chemical engineering, health profession, energy, physics, and astronomy, records that were either in press or not in their final published form, and records not presented in the English language. Through the application of these rigorous criteria, a total of 20 records were subsequently excluded

from the selection process. This discerning approach ensures that the chosen records precisely meet the defined scope and objectives of the review, upholding the quality and pertinence of the included studies.

## 2.5 Eligibility

During this stage, we identified records that couldn't be accessed due to various reasons, such as restricted availability or technical issues. These inaccessible records numbered eight in total. Additionally, we came across records that, upon closer examination, didn't pertain to the specific topic we were investigating. These records, totaling 17, were considered irrelevant as they did not provide the necessary information about ethical considerations or sustainability in the production and consumption of Halal meat. As a result, both the inaccessible and irrelevant records were excluded from the final analysis to ensure that the included studies were directly pertinent to our research focus.

## 2.6 Exploration

Upon completion of the screening process, the next crucial step involved the inclusion of records that met the predefined eligibility criteria for a more thorough examination and subsequent qualitative synthesis. This meticulous phase of the review was marked by a rigorous selection process to ensure that only the most relevant and methodologically sound studies were incorporated into the final analysis. In total, a comprehensive set of 34 records was estimated to be eligible for in-depth exploration. Each of these selected records represents a valuable contribution to our understanding of the ethical considerations, sustainability practices, and consumer dynamics within the Halal meat industry. The inclusion of these diverse sources ensures a holistic and nuanced exploration of the multifaceted aspects of Halal meat production and consumption, shedding light on the intricate interplay between ethics, sustainability, and consumer behaviors.

## 3 Result

### 3.1 Moral foundations of halal meat production

A positive personal attitude towards the consumption of Halal meat, motivation to comply with the opinions of important persons and institutions, and perceived control over consuming Halal meat predict the intention to eat Halal meat among Muslims. The moral foundations of Halal meat production are based on the principles of animal welfare, ethical handling of animals, and the concept of *halalan tayyiban* (wholesomeness) [18]. Islam teaches zero tolerance for all forms of animal abuse throughout the Halal meat production supply chain [19]. The Prophet Muhammad SWA emphasized the mindful and attentive slaughter of animals [20]. Thus, the Halal certification ensures that the entire supply chain, from farm to fork, follows good animal husbandry practices and maintains the Halal status [21]. The concept of *tayyiban* also ensures that the meat is free from any microbiological, physical, and chemical hazards [22]. In addition, the use of Halal animal feed is crucial for establishing the Halal authenticity of animal-based food products. The moral foundations of Halal meat production also involve addressing issues such as animal welfare, reducing animal suffering, and promoting empathy towards animals.

In the realm of Halal meat production, a robust moral foundation serves as the cornerstone. This moral framework is deeply rooted in religious significance, guided by the ethical imperative of upholding Islamic dietary laws. Essential components of this moral landscape include the practice of humane and ethical slaughter methods, ensuring minimal suffering for animals. Furthermore, transparency and certification processes are integral, assuring consumers of compliance with Halal standards [21]. Beyond religious obligations, the industry is increasingly embracing sustainability and environmental ethics, reflecting a broader commitment to responsible stewardship of resources. Policymakers, marketing managers, and ad agencies can focus their distribution and communication efforts on the growing local and international market for Halal food by using strategies based on religious self-identity, dietary assimilation, trustworthiness, and moral obligation [23]. Figure 3 illustrates the key moral principles that underpin the Halal meat industry, highlighting the relationship between religious significance, ethical slaughter practices, transparency, and sustainability in ensuring the ethical production of Halal meat.



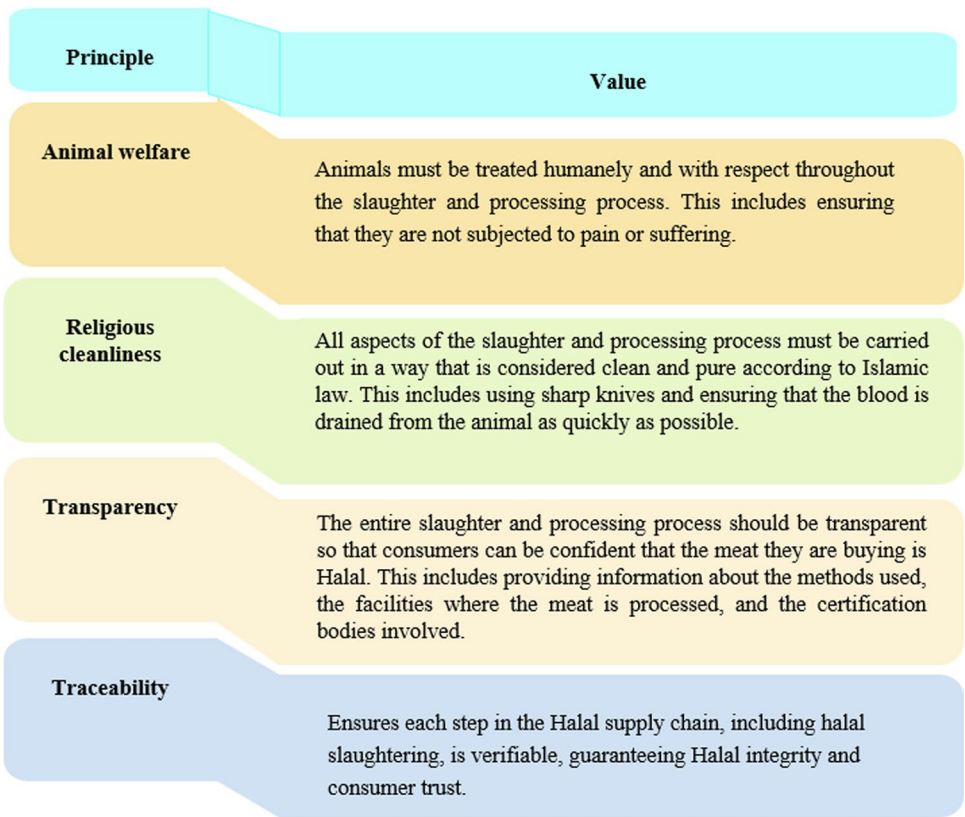
**Fig. 3** The Moral Foundations of Halal Meat Production



### 3.2 Principles and values in ethical practices in halal slaughter and processing

Ethical practices in Halal slaughter and processing are guided by principles and values derived from Islamic teachings. These principles encompass a multifaceted approach, encompassing the well-being of animals, the maintenance of food hygiene and safety, and the production of premium-quality Halal meat. Central to these practices is the adherence to the traditional method of slaughter as dictated by Shariah law, underscoring its significance in upholding the sanctity of the Halal process [24, 25]. Beyond the explicit guidelines, Islamic management principles and values, as expounded in the Quran and Hadith, exert a pivotal influence in fortifying governance and devising exemplary strategies within the Halal industry. In the Halal meat industry, ethical practices are not merely procedural requisites; they are embodiments of profound values. Foremost among these is a profound reverence for animal welfare, echoing Islamic tenets that advocate kindness and humane treatment towards animals [26]. This commitment manifests through meticulous practices like stunning prior to slaughter and the expedient drainage of blood to alleviate any potential suffering. Simultaneously, the concept of religious cleanliness assumes paramount importance, necessitating immaculate environments, the utilization of sharp and precise knives, and an unwavering commitment to maintaining the highest standards of hygiene throughout the slaughter process. Transparency emerges as a linchpin in fostering consumer trust and confidence. It mandates a forthright disclosure of the methods employed, coupled with rigorous facility inspections conducted by Halal authorities and certification bestowed by esteemed and trustworthy bodies. Moreover, traceability stands as an assurance to consumers, allowing them to establish a direct link between the meat they consume and its origin. This is facilitated through meticulous practices such as the recording of animal identification numbers, comprehensive labeling, and the establishment of transparent connections to processing slaughterhouses. While specific requirements may vary across different jurisdictions and countries, these overarching principles collectively serve as the vanguards of ethical standards in Halal meat production. Figure 4 serves as a comprehensive visual representation of these guiding principles and values, encapsulating their multifaceted significance in shaping the ethical attributes of Halal slaughter and processing. It is imperative to recognize that these principles and values not only ensure that Halal meat adheres to religious guidelines but also guarantee its purity, hygiene, and overall safety for consumption. In essence, Halal slaughter and processing, guided by these ethical imperatives, stand as a testament to the industry's unwavering commitment to producing food that is not only Halal but also held to the highest ethical and humane standards.

**Fig. 4** The principles and values that guide ethical practices in Halal slaughter and processing



3.3 Ethical treatment and animal welfare in the halal meat industry

The Halal meat industry places high importance on animal welfare and ethical treatment. The process of slaughtering animals follows strict regulations to ensure food hygiene, safety, and animal welfare [24]. The industry emphasizes the use of modern technologies to facilitate the slaughtering process while prioritizing animal welfare [9]. This emphasis encompasses adopting methods that improve animal welfare without compromising Halal slaughter requirements, which is crucial for aligning with both Islamic principles and contemporary animal welfare standards. For instance, advancements in restraining devices and slaughter techniques aim to minimize stress and pain for the animals, ensuring compliance with Halal criteria while adhering to animal welfare standards. Such integration of technology demonstrates the industry’s commitment to ethical practices that honor religious directives and prioritize the well-being of animals. This approach not only fulfills the religious obligation of Halal but also addresses public concerns regarding animal welfare in the slaughtering process [25]. In addition, the Halal meat supply chain incorporates Islamic business ethics to enhance transparency and accountability [26]. The industry aims to maintain the Halal status of the meat by practicing good animal husbandry, conducting ante-mortem inspections, and ensuring rapid bleeding during the slaughtering process. The review of Halal hunted game meat highlights the need for compliance with Halal requirements, including animal welfare and sustainability, in the industrial production of hunted game meat [19]. Overall, the Halal meat industry strives to provide quality and safe products while prioritizing animal welfare and ethical treatment.

3.4 Ethical labeling, sourcing, and certification in consumer choices on halal meat

To be considered Halal, a product must adhere to all syariah and/or Halal rules and guidelines throughout its entire production and distribution process [27]. Ethical labeling is the practice of designating products as meeting specific ethical criteria in their production and trade, provides assurance to consumers regarding adherence to certain ethical standards. These initiatives aim to introduce human values into supply chains and promote more sustainable

and ethical business practices. Ethical labeling plays a crucial role in humanizing business practices and introducing elements of socio-political regulation [28]. Ethical labeling not only underscores the ethical integrity of products but also influences consumer purchasing decisions, especially in markets sensitive to ethical production. For Halal meat, this form of labeling assures Muslim consumers that the products they choose are in strict compliance with Islamic dietary laws, thus fostering trust and increasing consumer satisfaction. Halal certificates provide assurance to Muslim consumers that the food they are buying is Halal and meets their religious requirements [29, 30]. Consumers prioritize the halalness of products when making purchasing decisions [31]. The presence of Halal labeling on products positively influences consumer purchase interest. The quality of food products and the role of Halal certificates contribute to consumer satisfaction and loyalty. Furthermore, Halal certification not only ensures the halalness of meat from the source but also provides legal protection for Muslim consumers. The inclusion of Halal certification on meat products increases consumer trust and satisfaction, enhancing the company's image and competitiveness [32]. Consumers positively evaluate the presence of certification on products and are willing to pay a premium for certified products [33]. Sustainability certifications are third-party assessments that verify a company or product has met specific standards related to environmental, social, and economic sustainability. These certifications can cover a wide range of areas, including energy efficiency, waste reduction, fair labor practices, and more. They serve as a guide for consumers and businesses looking to make responsible choices that contribute to sustainable development [34, 35]. Sustainability certifications have a significant influence on consumer preferences, increasing the evaluation of products [36]. Consumers integrate their evaluations of ethical attributes with other service features when making brand choices [37]. The successful communication of ethical product features, including comprehensibility, meaningfulness, and credibility, can influence consumers to choose ethical products. Product-specific information, such as labeling, plays an important role in influencing consumer attitudes and behavioral intentions to purchase organic food products [38]. Thus, ethical labeling, sourcing, and certification are crucial factors that influence consumer choices and provide confidence in the halalness and quality of meat products.

### 3.5 Consumer attitudes and behaviors related to ethical consumption of halal meat

A positive personal attitude toward the consumption of Halal meat, motivation to comply with others, the perceived control over consuming Halal meat, and the availability of Halal meat predicts the intention to eat Halal meat among Muslims' consumers [39]. Consumer attitudes and behaviors related to the ethical consumption of Halal meat have been studied in several papers. One study found that education using audiovisual media, such as videos, can effectively change attitudes and behaviors in high school students [40]. Another study conducted in England found that the majority of Halal meat consumers preferred meat from animals slaughtered without stunning [41]. A study in Kano, Nigeria, proposed that factors such as attitude, subjective norm, perceived behavioral control, product knowledge, product trust, celebrity endorsement, religiosity, and personal norm influence consumer purchase intention of Halal meat products [42]. Additionally, a study conducted in Yogyakarta, Indonesia, using the Theory of Planned Behavior (TPB) found that attitudes, subjective norms, and perceived behavioral control directly influenced the purchasing intention of Halal beef, with self-identity (religiosity) moderating this relationship [43]. These studies provide valuable insights into consumer attitudes and behaviors towards the ethical consumption of Halal meat. Figure 5 describes the consumer attitudes and behaviors related to the ethical consumption of Halal meat. These factors have been shown to influence consumer attitudes and behaviors related to the ethical consumption of Halal meat. For example, studies have found that individuals with higher religious commitment, motivation to comply, and self-identity are more likely to consume Halal meat. Additionally, individuals who believe that Halal food is healthier, safer, and more ethically produced are also more likely to consume it. It is important to note that the relative importance of these factors may vary depending on the individual and the context. For example, the availability of Halal food in an individual's area may be more important for their decision to consume it than their religious commitment. Additionally, the ethical considerations that are important to an individual may vary depending on their own personal values and beliefs.

Thus, the research on consumer attitudes and behaviors related to the ethical consumption of Halal meat suggests that a variety of factors influence these decisions. These factors can be religious, social, personal, and environmental. By understanding these factors, businesses and organizations can better understand the needs and preferences of consumers and develop marketing strategies that appeal to them.

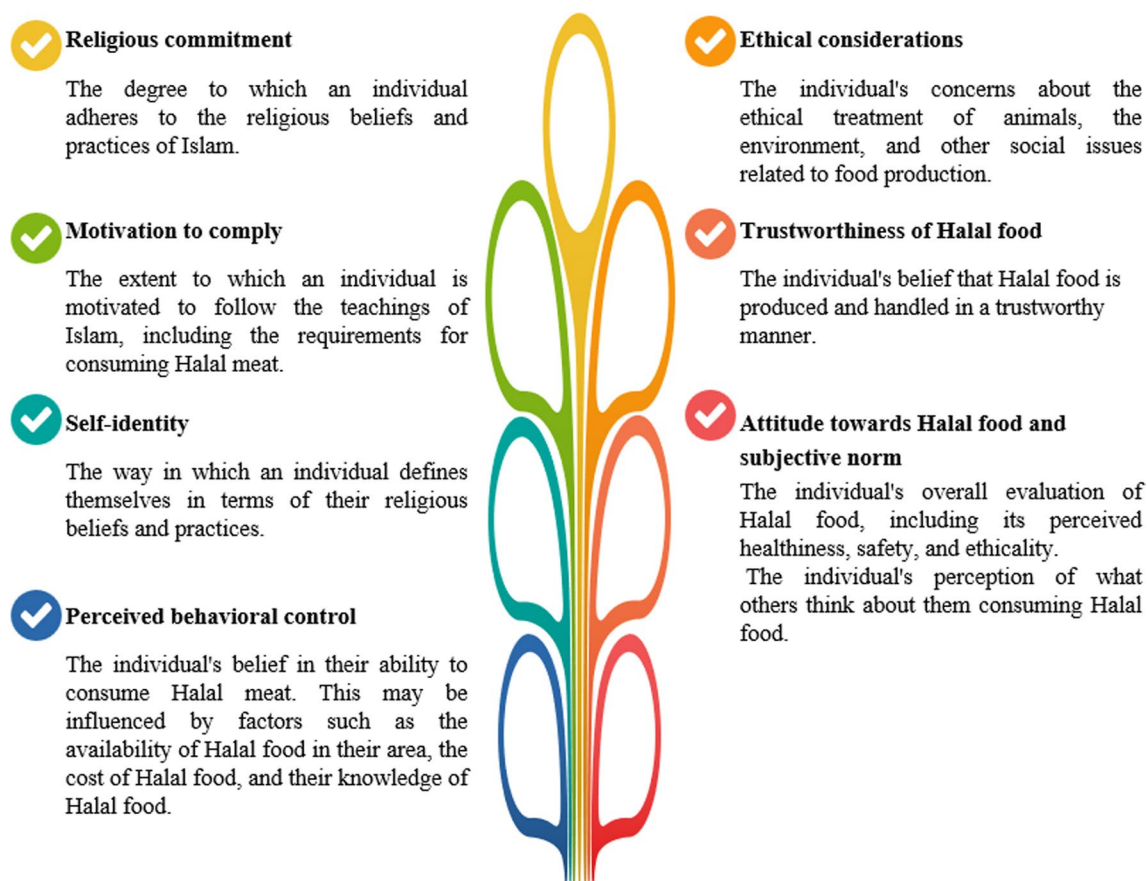


Fig. 5 Consumer attitudes and behaviors related factor for ethical consumption of Halal meat

### 3.6 Country regulations and consumer ethical choices in halal meat production

The current methods of animal slaughter may fall into two categories: conventional and religious techniques. Conventional slaughter typically involves the use of stunning methods, such as electrical, gas, or mechanical means, to render the animal unconscious before cutting its neck. On the other hand, religious slaughter adheres to religious guidelines. Country regulations play a crucial role in shaping consumer choices and ethical considerations in Halal meat production. These regulations can vary significantly across different regions, influencing both the availability and perception of Halal meat products. For instance, in countries with stringent Halal certification processes, consumers may have higher confidence in the ethical standards of the meat they purchase [44]. Conversely, in regions where regulations are more relaxed, there may be greater skepticism among consumers regarding the Halal authenticity and ethical treatment of animals.

One of the most contentious issues in Halal meat production is the stunning procedure. This process, intended to minimize animal suffering before slaughter, is mandated in some countries and regions, while others strictly prohibit it based on religious grounds. The acceptance of the stunning procedure varies widely, with some Muslim-majority countries like Malaysia and Indonesia permitting reversible stunning while others like Pakistan do not. Consumers who consume halal meat prioritize the spiritual aspect of meat quality in addition to the conventional attributes. While studies have demonstrated that stunning methods improve animal welfare, they can negatively impact meat quality. These include muscle spasms and hemorrhages resulting from electrical stunning as well as central nervous system embolism caused by mechanical stunning [45]. According to Salwani et al. [46], gas stunning has the potential to decrease water holding capacity and meat redness in broiler chickens. The use of stunning methods that result in animal death can lead to inadequate bleeding, which in turn increases the risk of oxidative and microbial deterioration. Religious slaughter, when not carefully implemented, can potentially compromise animal welfare, despite its ability to preserve meat quality.

The regulatory frameworks concerning slaughter methods differ greatly among countries, reflecting a wide range of ethical and cultural factors. Modified in 1972, the 1958 Humane Slaughter Act mandates the rendering of animals

unconscious through stunning before the process of exsanguination. However, there are exceptions for religious slaughter in accordance with Jewish and Islamic teachings [47]. On the other hand, stunning has been a requirement in the European Union since 1979, although there are provisions for exceptions. Denmark, Sweden, Slovenia, Iceland, and Norway have regulations that require stunning before religious slaughter. Liechtenstein and Switzerland also require stunning before slaughter, except for poultry [48]. The halal slaughter standards in GCC Member States, Indonesia, Malaysia, and the Islamic Food and Nutrition Council of America require that animals be alive during the slaughter process and that stunning methods do not result in death prior to slaughter. The Humane Methods of Slaughter Act and European Council Regulation EC 1099/2009 allow for religious slaughter without stunning [48].

Employing certain strategies by aligning beliefs may enhance the ethical treatment of animals in halal meat production. These strategies include securely restraining the animals in a comfortable and upright position, ensuring their unconsciousness before removing them from the restrainer, using knives that are very sharp and twice the width of the neck, and minimizing the time between the cut and the loss of consciousness [49]. It is crucial to involve religious authorities, encourage education, and facilitate international collaboration to advance animal welfare standards in halal meat production while respecting religious practices.

### 3.7 Islamic ethic with dietary laws and sustainability

Islamic dietary laws, based on the Quran and Hadith, delineate what is permissible (Halal) and forbidden (haram) for Muslims to consume, including specific prohibitions on pork and requirements for meat slaughtering practices. Following these laws is seen as an act of faith, with potential health benefits highlighted, such as the encouragement of breastfeeding and a reduction in iron deficiency risks. However, strict adherence may lead to nutritional challenges without proper dietary management [12]. Religious dietary laws encompass the food regulations of various religions, which can include restrictions on the types of food consumed, preparation methods, and consumption times. For example, in addition to Islamic dietary laws, Jewish kosher laws also dictate permissible animals and specific slaughtering practices. These laws are often rooted in religious texts and traditions and can have implications for health and nutrition. The Quran is the basis for Islamic dietary norms [50]. Islamic ethical choices play a significant role in upholding religious dietary laws. These choices are not just a pretense but rather a divine command that protects against diseases [11]. Islamic scholars explain the lawful and unlawful foods in Islam, relying on the Quran and Hadiths as well as different schools of thought [51]. The Islamic food tradition offers a unique perspective on food ethics and politics, which has been under-theorized in current discourse [52]. By following ethical choices, individuals adhere to the principles set forth by their religion and maintain the sanctity of their dietary laws and sustainable production system. Thus, Islamic ethical choices play a significant role in upholding dietary laws and the sustainability of Halal meat production. Meanwhile, by making choices that are compassionate and hygienic, Muslims fulfill their religious obligations and ensure that their food is safe, healthy, ethical, and sustainable. Table 1 illustrates ethical choices and their significance in upholding Islamic dietary laws, along with their contribution to religious dietary laws and sustainability.

### 3.8 Ethical cultural and sustainability in halal meat consumption

Muslims, driven by both faith and an understanding of the health benefits, have led to an increased global demand for Halal meat due to the expanding Muslim population [6]. This surge transforms the preference for Halal meat into a potent expression of faith and identity among Muslims. At its core, this preference is anchored in the moral considerations embedded within the Islamic faith [53]. These heightened sensitivities are facilitated by factors like Halal labeling and distinctive packaging, signaling adherence to Islamic dietary regulations. Additionally, enhanced regulatory oversight actively shapes consumers' decision-making processes, creating an environment of trust and transparency and allowing consumers to make informed, ethically sound choices about their dietary preferences. In consuming Halal meat, it is imperative to consider a spectrum of ethical factors that contribute to a sustainable Halal meat industry. Animal welfare is of paramount concern for many Muslims, leading to a burgeoning movement advocating for humane treatment within the Halal meat industry. This involves practices such as stunning animals before slaughter to minimize pain, using sharp knives for a swift and clean cut, promptly draining the blood, and providing a comfortable environment. Furthermore, religious cleanliness is a cornerstone of Halal meat production, necessitating that slaughter and processing align with Islamic law's standards of cleanliness and purity. This encompasses the use of hygienic facilities and meticulous handling of the meat. Additionally, environmental sustainability must be a focal point, requiring practices that reduce resource usage and waste while avoiding harm to the environment [54]. Social justice is equally important, demanding fair treatment



**Table 1** Ethical Choices in Upholding Islamic Dietary Laws, Religious Dietary Laws, and Sustainability:

Ethical choice	Significance in upholding Islamic dietary laws	Contribution to upholding religious dietary laws	Contribution to sustainability
Animal welfare	Ensures humane treatment of animals in slaughter and processing. Prevents suffering and aligns with Islamic values	Recognizes animals as sentient beings, promoting kindness and compassion in treatment	Promotes sustainable and humane treatment of animals, aligning with ethical and environmental values
Religious cleanliness	Requires clean and pure processing according to Islamic law, including sharp knives and quick blood drainage	Ensures food is prepared in a clean, hygienic manner, reflecting purity in Islam	Ensures safe and hygienic food production, reducing the risk of foodborne illnesses, and supporting overall public health
Transparency	Advocates for transparent slaughter and processing, providing information on methods, facilities, and certifications	Builds trust by ensuring consumers know they are buying Halal meat	Fosters a transparent and accountable food supply chain, supporting consumer awareness and informed choices
Traceability	Mandates traceability of Halal meat back to its source animal, ensuring compliance with Halal principles	Enables consumers to be confident in the origin of the meat they buy	Supports responsible sourcing and production practices, allowing consumers to make informed and sustainable choices. Helps prevent fraud and mislabeling in the meat supply chain



of all involved parties, including workers, animals, and the environment [55]. Lastly, transparency is fundamental to consumer trust, underscoring the need for a clear and certified production process. By conscientiously weighing these ethical and sustainability considerations, consumers play a pivotal role in ensuring that the Halal meat they choose aligns with principles of humane, sustainable, and ethically sound food practices. Islam places a strong emphasis on adhering to dietary laws and ethical principles, which are inextricably linked to the concept of Halal. For devout Muslims, consuming Halal meat is not merely a culinary choice but a sacred obligation, aligning their dietary practices with the tenets of their faith. This ethical dimension adds a profound layer of significance to their choice of Halal meat. Moreover, awareness of Halal food has grown significantly among Muslim consumers [56].

Rooted in Islamic faith and cultural heritage, the demand for Halal meat symbolizes a complex expression of identity and religious practice. This preference is amplified by cultural traditions and community values, making Halal meat a key component of social and religious life. Central to Islamic culture, Halal meat embodies the principles of purity and ethical consumption dictated by Islamic law. It serves not only as a reflection of religious adherence but also as a celebration of a rich cultural heritage that spans centuries. In Muslim societies, Halal meat plays a pivotal role in fostering community bonds and cultural continuity [57]. It is at the heart of family gatherings, religious celebrations, and everyday meals, acting as a vessel for passing down traditions and reinforcing a shared sense of identity. This cultural significance is further enriched by the rituals and customs surrounding Halal meat preparation and consumption. Thus, Halal meat is not merely about adhering to dietary laws; it's a vibrant expression of faith, identity, and continuity of cultural heritage, making Halal meat an integral part of social and religious life across diverse Muslim communities [23].

Thus, Halal meat consumption is deeply influenced by a blend of ethical, cultural, and sustainability considerations, reflecting its significance beyond a simple dietary choice. Table 2 encapsulates the multifaceted approach to Halal meat consumption, highlighting the significant role of ethical, cultural, and sustainability considerations in fostering humane, sustainable, and culturally respectful Halal meat consumption. It demonstrates the deep connection between Islamic dietary practices and the broader values of environmental stewardship, social equity, and cultural integrity, reflecting a comprehensive commitment to ethical consumption within the Muslim community.

### 3.9 Ethical considerations and sustainability practices in halal meat industry

The importance of ethically slaughtered animals for consumption by people of faith is significant [26]. Within the Halal meat industry, sustainability practices have ignited important ethical discussions. The increasing meat consumption in Muslim-majority countries has raised significant concerns for health and environmental sustainability, leading to the exploration of alternative protein sources as potential solutions [6] (Attwood et al.). Companies often adopt integrated reporting and sustainability frameworks to highlight their commitment to Halal practices and sustainability objectives [65].

Halal logistics management involves strict adherence to Halal standards, precise execution, and certification, which are crucial for maintaining the supply chain's integrity [66]. In the realm of Halal tourism, culinary stakeholders for meat ensure their products are fully aligned with the Halal supply chain, enhancing the sustainable appeal of Halal tourism [67]. The meat supply chain has received increased academic attention for its sustainability practices, emphasizing the need for detailed, inclusive strategies to foster more sustainable meat supply chains [68].

The pursuit of sustainability in the Halal meat industry requires careful consideration of ethical factors. Achieving a balance is crucial for developing practices that honor ethical integrity and sustainability. Sustainable farming techniques, such as crop rotation, cover cropping, and using organic fertilizers, are essential for environmental protection. Renewable energy integration, like solar, wind, and biomass, plays a key role in reducing emissions and enhancing environmental protection. Fair treatment of workers, ensuring fair wages and safe conditions, forms the foundation of the industry's sustainability efforts [61].

According to the Malaysian Islamic Development Department (JAKIM), Halal certification is essential for human food but not obligatory for animal feed. However, ensuring the safety and quality of animal feed aligns with Islamic principles of food safety (Tayyib) to safeguard human health. Ingredients used in animal feed must not pose hazards to human health and should be sourced adhering to Islamic rules [69]. The connection between animal feed and animal welfare is deeply intertwined, influencing the overall health, behavior, and well-being of animals. Proper animal feed is essential for ensuring that animals receive the necessary nutrients for growth, reproduction, and maintaining a healthy state. The quality and composition of animal feed directly affect animals' physical condition, influencing their immune system, energy levels, and capacity to engage in natural behaviors. From an Islamic perspective, the principle of Tayyib emphasizes not only the Halal status of food but also its wholesomeness and safety, extending these concerns to animal feed. Ensuring

**Table 2** Integrating Ethical, Cultural, and Sustainability Considerations in Halal Meat Consumption

Ethical and cultural consideration	Description	Sustainability measures	References
Animal welfare	Animals must be treated humanely and with respect throughout the slaughter and processing process. This includes ensuring that they are not subjected to pain or suffering	Humane handling, minimizing stress, and providing a comfortable environment for animals	[21, 26]
Religious cleanliness	All aspects of the slaughter and processing process must be carried out in a way that is considered clean and pure according to Islamic law. This includes using sharp knives and ensuring that the blood is drained from the animal as quickly as possible	Hygienic facilities, meticulous handling, and adherence to Islamic standards of cleanliness and purity	[58, 59]
Environmental sustainability	The production of Halal meat must be carried out in a way that is environmentally sustainable. This includes minimizing the use of resources and waste	Sustainable sourcing, reducing resource consumption, and minimizing waste in production	[60, 61]
Social justice	The production of Halal meat must be carried out in a way that is fair and just to all involved, including the workers, the animals, and the environment	Fair labor practices, ensuring worker welfare, and promoting ethical treatment of animals and environment	[62, 63]
Transparency	Consumers must be able to trust that the meat they are buying is Halal. This means that the production process must be transparent, and that the meat must be certified by a reputable Halal authority	Clear labeling, certification by recognized Halal authorities, and transparent supply chain practices	[60, 64]
Cultural integrity and identity	Halal meat consumption signifies adherence to Islamic cultural heritage, including traditions associated with its preparation and consumption	Integration of cultural practices in production and marketing, reflecting Islamic traditions and diversity	[23, 57]

that animal feed does not contain any harmful substances is crucial, as it impacts the health of the animals and, consequently, the humans who may consume their meat or products. Furthermore, the humane treatment of animals, including their feeding, is an important aspect of animal welfare. Feeds that enhance animal welfare by meeting their dietary needs without causing harm or distress align with both Islamic principles and the broader goals of sustainability and ethical farming practices. Furthermore, recognizing the connection between animal feed and human health underscores the importance of ensuring the welfare of animals in the production process, contributing to sustainable development goals such as SDG 12 (Sustainable Consumption and Production). Animal welfare is integral to sustainability, addressing the physical and mental state of animals in their living conditions. Ensuring good welfare involves comprehensive care, including disease prevention, proper nutrition, and humane handling and slaughter practices [70].

Supporting local communities through responsible sourcing and supporting local businesses acts as a driving force for local economic growth and job creation. These practices showcase the sector's capacity for significant change through a dedicated commitment to sustainability and ethical considerations, setting a course towards a more sustainable and ethically responsible industry. These highlight various aspects of sustainability factors within the Halal meat industry, including environmentally friendly farming techniques, renewable energy integration, fair treatment of workers, and support for local communities. These practices are crucial for ensuring not only ethical standards but also long-term sustainability in the industry. Figure 6 illustrates the holistic approach of the Halal meat industry to ethical considerations and sustainability practices. It highlights how animal welfare, environmental protection, social and economic impacts are addressed through humane, eco-friendly, and community-supportive practices. These efforts not only align with Islamic principles but also contribute to the industry's sustainable development, emphasizing the interconnection between ethical practices and positive impacts on both society and the environment.

### 3.10 Legal framework in sustainable Halal meat production

The existing legal framework governing Halal meat production, characterized by its scattered and non-unified structure, has significantly impeded effective regulatory control [71]. This fragmented regulatory environment, for example, in Malaysia involves multiple agencies, including JAKIM, Customs Malaysia, the Ministry of Domestic Trade and Consumer Affairs, the Department of Veterinary Services, and the Ministry of Health. These entities face issues related to unclear roles

**Fig. 6** Ethical and Sustainability Integration in the Halal Meat Industry

Ethical consideration	Sustainability practice	Impact and Integration
<b>Animal Welfare and Feed Quality</b>	Humane slaughter methods, high-quality feed from Halal sources.	Enhances animal health, aligns with Islamic principles, and ensures the production of wholesome meat.
<b>Environmental Protection</b>	The use of sustainable farming practices for meat production, the reduction of food waste, and the use of renewable energy.	Protects ecosystems, conserves resources, and supports long-term ecological balance.
<b>Worker equity Social impact</b>	Fair labor practices and support for local businesses.	The fair treatment of workers, the support of local communities, and the promotion of ethical trade.
<b>Economic impact</b>	Local sourcing and investment in local economies.	Drives economic development, creates jobs, and underpins the financial sustainability of the halal meat industry.

and poor coordination, which have been directly linked to the current inefficiencies and conflicts within the system [19]. Further complicating the situation, the lack of clear jurisdiction among these agencies has led to multiple operational challenges, as noted by [72] and [73], which highlight the resulting uncertainty and disorganization. Additionally, the Food and Agriculture Organization and the World Health Organization have criticized the multi-agency approach for its contribution to lack of coherence, excessive regulation, and timing gaps that undermine the effectiveness of regulatory activities [74]. The need for a streamlined and unified legal framework is evident, as it would enhance the sustainability and ethical standards of Halal meat production by providing clearer guidelines and improved coordination among the involved authorities. The implementation of robust legal processes is essential for maintaining the ethical and sustainable dimensions of Halal meat production and consumption. Efficient enforcement by legal agencies is pivotal, and specialized legal training for officers involved in Halal meat enforcement activities is a strategic investment that equips them with the necessary skills to uphold Halal integrity [75].

### 3.11 Traceability in sustainable Halal meat production

Traceability is an indispensable instrument that aids in addressing food safety concerns, documenting the entirety of the production chain, ensuring compliance with regulatory obligations, and conducting logistics and cost analyses [75]. Traceability in the Halal meat industry is a critical aspect that ensures the integrity and adherence to Islamic principles throughout the supply chain. It involves the ability to track the movement of Halal meat from its point of origin to the consumer, allowing for transparency and accountability at every stage of production and distribution. This includes documenting crucial information such as the source of the meat, the methods of slaughter, and the handling procedures to ensure compliance with Halal standards. By establishing and enforcing transparent procedures related to the cross-border handling of the supply chain for Halal meat, the industry can enhance accountability and traceability. This involves rigorous documentation and verification processes to verify the authenticity and integrity of Halal products as they move through different stages of production and distribution. Clear labeling and certification by recognized Halal authorities further contribute to traceability efforts, providing consumers with the assurance that the meat they are purchasing adheres to Islamic principles. This comprehensive approach not only aligns with Islamic business ethics but also contributes to the development of a more robust and sustainable structure within the Halal ecosystem. In essence, the legal processes for Halal meat sustainability extend beyond mere compliance; they serve as a cornerstone for fostering ethical practices, ensuring wholesomeness in production, and minimizing environmental impact. By integrating traceability measures into Halal meat production, stakeholders can work together to nurture a responsible and conscientious Halal meat industry that prioritizes transparency, accountability, and adherence to Islamic principles.

## 4 Implication recommendations and future direction

### 4.1 Implications

This article embarks on an in-depth exploration of the nexus between Islamic ethical mandates and sustainability within the Halal meat industry. By advocating for the seamless integration of Islamic ethics throughout the supply chain, the paper sheds light on the pivotal role such ethics play in bolstering sustainability, enhancing transparency, and ensuring accountability.

At the heart of Halal meat production lies a set of moral foundations—principles of animal welfare, ethical handling, and adherence to the concept of *halalan tayyiban* (ensuring food is both permissible and wholesome). These foundations are critical for defining the ethical landscape of the industry. Furthermore, the article emphasizes the significance of Halal certification as a means to uphold the integrity of the supply chain, illustrating how ethical considerations intertwine with sustainability measures to cultivate a sector that is not only responsive but also responsible.

The contributions of this study extend far beyond a mere academic discourse, offering tangible insights into the integration of ethical practices with sustainability to forge a Halal meat industry characterized by conscientiousness and responsibility. It underscores the industry's potential to positively impact environmental sustainability, influence societal dynamics, and adhere to an ethos of responsible practices.

In essence, the findings from this research illuminate the critical intersections of Islamic ethics with sustainability efforts, underscoring the importance of these elements in shaping a future where the Halal meat industry serves as a benchmark for ethical and sustainable food production.

## 4.2 Recommendations

### 4.2.1 Enhancing supply chain integrity

To further enhance Halal meat production and consumption in an ethical and sustainable manner, several key factors must be considered. Primary among these is the incorporation of Islamic business ethics to augment transparency and accountability within the Halal supply chain. This involves adhering to cross-border handling procedures and implementing a robust framework for the Halal ecosystem. Strengthening certification processes is also essential to ensure compliance with ethical standards and sustainability practices, providing assurance to both consumers and the industry.

### 4.2.2 Legal and educational framework

Efficient enforcement processes by legal agencies play a crucial role in the Halal meat industry. This can be achieved through comprehensive legal training and education for officers involved in Halal meat enforcement activities. Additionally, integrating ethical values and sustainability principles into educational programs related to Halal meat production and consumption is vital. This fosters a culture of responsibility and accountability among industry professionals.

### 4.2.3 Holistic approach to sustainability

Adopting a holistic approach that aligns the current food system cycle with the concept of *halalan tayyiban* is imperative. This approach should focus on ensuring the wholesomeness of Halal meat production and consumption while minimizing environmental impacts. By implementing sustainable practices throughout the supply chain, such as responsible resource management and reduced carbon emissions, the industry can contribute to long-term environmental sustainability and meet consumer demands for ethically and sustainably sourced products.

## 4.3 Future directions

### 4.3.1 Development of Halal industry strategies

Research should focus on strategies including standardization, branding, and human resource training, with an emphasis on sustainability.

### 4.3.2 Government policies impact

Investigate the impact of government policies on the Halal industry and identify ways to enhance government support for sustainability initiatives.

### 4.3.3 Islamic business ethics in the supply chain

Explore the role of Islamic business ethics in ensuring supply chain transparency and accountability while incorporating sustainable practices.

### 4.3.4 Policy and industry initiatives

Prioritize effective government policy implementation and training programs to enhance Halal industry development, with a special focus on sustainability. Initiatives should aim to improve slaughterhouse performance, addressing various requirements while incorporating sustainable practices.

Thus, future research, policy development, and industry initiatives should collaboratively strive to enhance the integrity, transparency, and sustainability of the Halal meat market. By addressing these key areas, we can ensure a more ethical and environmentally responsible approach to Halal meat production and consumption.

## 5 Conclusion

The ethical integrity of Halal meat production is a multifaceted endeavor grounded in a robust moral framework deeply rooted in Islamic tradition. At its heart, this industry revolves around humane and ethical slaughter practices, animal welfare, transparency, and strict adherence to Halal standards. Moving beyond religious imperatives, industries should increase their commitment to sustainability, and environmental stewardship marks a significant evolution, aligning with ethical consciousness, traceability, and legal practices.

Looking forward, the Halal meat industry faces a dynamic landscape where policy, research, and industry initiatives intersect. Key areas like standardization, branding, and human resource development are poised to shape its future. Government policy, in particular, plays a critical role, necessitating alignment with the industry's evolving needs and values. The continuous integration of Islamic business ethics is essential in maintaining supply chain transparency and accountability.

As the global Muslim population grows and ethical consumerism gains momentum, the Halal meat industry's response to these shifts will be crucial. It is vital that the industry not only adheres to religious mandates but also exemplifies ethical integrity, sustainability, and compassion. The path ahead calls for strategic collaboration, innovative policy-making, and a collective dedication to ethical and sustainable practices. By embracing these values, the Halal meat industry can meet the growing international demand and set a standard for ethical excellence in the years to come.

**Acknowledgements** The authors express deep gratitude to the Islamic University of Sultan Sharif Ali and Seri Begawan Religious Teacher University College, Brunei Darussalam, as well as Kolej Universiti Islam Perlis, Malaysia, for their valuable support. We also acknowledge the Institute of Halal Management, Islamic Business School, Universiti Utara Malaysia, for supporting this research.

**Author contribution** Md Mahfujur Rahman spearheaded the primary research, including data collection and analysis, forming the backbone of the study. Mohd Shahril Ahmad Razimi significantly contributed to shaping the research objectives and diligently reviewed the manuscript, ensuring its alignment with academic standards. Ahmad Shabudin Ariffin played a pivotal role in data analysis and interpretation, offering critical revisions that enhanced the manuscript's depth and clarity. Norkhairiah Hashim focused on conducting a comprehensive literature review, providing a solid theoretical foundation for the research.

**Data availability** The datasets generated and/or studied during this research can be made available upon reasonable request.

## Declarations

**Competing interests** The author declares no competing interests in publishing this article.

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