SUSTAINABILITY INTEGRATION HALAL SUPPLY CHAIN OF THE FOOD INDUSTRY: A CASE STUDY OF UD. WND FOOD JEMBER

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Abstract

The halal food and beverage industry in Indonesia has shown significant growth, driven by increasing consumer awareness of halal, healthy, and environmentally friendly products. This situation demands that the halal industry not only prioritize Sharia compliance but also integrate sustainability principles, encompassing environmental, social, and economic aspects, into its supply chain. This research focuses on analyzing the integration of the halal tenets with ecological ethics, logistics efficiency strategies, the application of the zero-waste supply chain concept, and identifying barriers and opportunities in implementing a sustainable halal supply chain in the food industry. The aim is to examine in depth the integration of sustainability in the halal supply chain as an effort to support business sustainability and industrial competitiveness. Through a qualitative approach with an exploratory case study type, with data collection techniques through observation, interviews, and documentation, resulting in findings that UD. WND Food Jember has integrated halal principles with environmental ethics consistently through the use of halal-certified raw materials, hygienic production processes, environmentally friendly waste management, partnership strategies to improve logistics efficiency, and the application of the zero-waste supply chain concept through efforts to minimize waste and limited utilization of production waste. The integration of sustainability in the halal supply chain that has been carried out by WND Food Jember has become an ideal model for the development of a sustainable halal food industry for the food industry in general.

Keywords: *Sustainability Integration, Halal, Supply Chain*

Abstrak

Perkembangan industri makanan dan minuman halal di Indonesia menunjukkan pertumbuhan yang signifikan seiring meningkatnya kesadaran konsumen terhadap produk halal, sehat, dan ramah lingkungan. Kondisi ini menuntut industri halal tidak hanya berorientasi pada kepatuhan syariah, tetapi juga mampu mengintegrasikan prinsip keberlanjutan yang mencakup aspek lingkungan, sosial, dan ekonomi dalam rantai pasoknya. Fokus penelitian ini adalah menganalisis integrasi prinsip halal dengan etika lingkungan, strategi efisiensi logistik, penerapan konsep zero-waste supply chain, serta mengidentifikasi hambatan dan peluang dalam penerapan rantai pasok

halal yang berkelanjutan pada industri makanan. Tujuannya untuk mengkaji secara mendalam integrasi keberlanjutan dalam rantai pasok halal sebagai upaya mendukung keberlanjutan usaha dan daya saing industri. Melalui pendekatan kualitatif dengan jenis studi kasus eksploratif, dengan teknik pengumpulan data melalui observasi, wawancara dan dokumentasi, menghasilkan temuan bahwa UD. WND Food Jember telah mengintegrasikan prinsip halal dengan etika lingkungan secara konsisten melalui penggunaan bahan baku bersertifikat halal, proses produksi higienis, pengelolaan limbah ramah lingkungan, strategi kemitraan untuk meningkatkan efisiensi logistic, serta penerapan konsep zero-waste supply chain melalui upaya minimasi limbah dan pemanfaatan limbah produksi secara terbatas. Integrasi keberlanjutan dalam rantai pasok halal yang telah dilakukan oleh WND Food Jember menjadi model ideal pengembangan industri makanan halal berkelanjutan bagi industry makanan pada umumnya.

Kata Kunci: *Integrasi Keberlanjutan, Rantai Pasok Halal*

INTRODUCTION

Indonesia, the world's largest Muslim-majority country, has significant potential for halal industry development, particularly in the food and beverage sector. However, current global developments are pushing this industry not only to comply with Sharia principles but also to integrate sustainability, including environmental, social, and economic aspects.(Hadi, 2023)

A sustainable halal supply chain is a crucial concept that combines halal integrity with environmental responsibility, logistical efficiency, and a zero-waste approach. In practice, the Indonesian food and beverage industry still faces challenges in validating that the entire production and distribution process is not only halal but also efficient and environmentally friendly.

This study aims to examine sustainability integration strategies in the halal supply chain of the food industry at UD. WND Food Sumbersari Jember using an exploratory case study approach. This study focuses on how halal principles are integrated with economic, social, and environmental sustainability aspects at every stage of the supply chain, from raw material procurement, production processes, to product distribution. Data collection was conducted through semi-structured interviews, field observations, and documentation studies of parties involved in the supply chain. Data were analyzed qualitatively to identify patterns, practices, and challenges and opportunities in implementing sustainability strategies. The results of the study are expected to provide an

empirical overview and practical recommendations for the development of a sustainable halal supply chain in the business-scale food industry in Jember Regency.

The concept of sustainability in the halal supply chain has been studied by Anisah Dewi, entitled "Green Halal: Synergy of Halal Industry and Sustainable Development." The results of her research explain that Green Halal shows a relationship, so that in practice it requires the attention of various parties: consumers, suppliers, society, and the government as a regulator. The challenges faced include Green Halal awareness from suppliers from upstream to downstream, cooperation between raw material providers, processors, packaging, transportation services, distributors, to consumers to realize Green Halal, with the availability of infrastructure and regulations supported by the government, supervision and assistance are also needed as the next stage of Green Halal socialization to ensure industrial processes are in accordance with the principles of sustainability and halal principles. (Anisah, 2024)

Yelita Anggiane Iskandar et al. also explained the importance of halal supply chain sustainability in their study entitled "Green and Halal Supply Chains as a Strategy for Sustainable Tourism Development in Alamendah Tourism Village" that the implementation of green supply chains in halal tourism not only creates economic added value, but also has a positive impact on the environment and society, in line with sharia values that emphasize aspects of blessing, health, and responsibility. Green supply chains in halal tourism are not only limited to environmental sustainability, but also include compliance with halal principles in every process.(Iskandar et al., 2025)

The importance of halal integrity in the supply chain requires a thorough understanding of the entire process from upstream to downstream, including raw materials, production, and distribution. This is crucial to prevent contamination, which can compromise a product's halal status, and to support sustainability principles that reduce waste. For example, in several countries, the implementation of robust halal traceability systems has proven highly effective in maintaining halal integrity in the supply chain, enabling manufacturers to be more responsive to environmental concerns.(Mohamed et al., 2020)

Anisah Dewi's research did not emphasize integration, but merely aligned green halal with the halal industry and sustainable development. Meanwhile, Yelita Anggiane

Iskandar et al.'s research integrated sustainability by considering economic, social, and environmental aspects, as well as halal principles. However, this was applied to tourism, differing from the mechanisms used in the food industry. Furthermore, Mohamed et al.'s research emphasized waste reduction and environmental protection. This research gap led to a more comprehensive integration of the halal food industry's supply chain sustainability.

The concept of a sustainable halal supply chain embodies the integration of halal integrity, environmental responsibility, logistical efficiency, and zero waste. This is particularly relevant for the Indonesian food and beverage industry, which, despite its significant potential, still faces challenges in its implementation. The halal supply chain in Indonesia is required not only to meet halal requirements but also to be efficient and environmentally friendly.

This research is significant because it seeks to explore in-depth how sustainability integration strategies can be implemented in the halal supply chain of the MSME-scale food industry. This study is expected to provide an empirical overview of existing practices, challenges faced, and opportunities for developing a contextual and applicable sustainable halal supply chain model. With increasing consumer awareness of ethical and sustainable products, this research is crucial for exploring strategies that can be implemented to comprehensively optimize the halal supply chain.

LITERATURE REVIEW

The importance of halal supply chain sustainability is explained by Yelita Anggiane Iskandar et al., that the implementation of a green supply chain in halal tourism not only creates added economic value but also has a positive impact on the environment and society, in line with sharia values that emphasize aspects of blessing, health, and responsibility. The green supply chain in halal tourism is not limited to environmental sustainability alone, but also includes compliance with halal principles in every process, from material procurement, production, distribution, to waste management. Thus, proper implementation will produce dual benefits: providing environmentally friendly tourism while meeting the needs of Muslim tourists who are increasingly critical of halal and sustainability.(Iskandar et al., 2025).

Sustainability can be implemented with a circular economy. The benefits of implementing circular economy principles include: First, companies can realize significant benefits by implementing circular economy practices in their supply chains. These include cost reduction, resource efficiency, risk mitigation, innovation, and environmental protection. Through initiatives such as redesigning products for circularity, investing in recycling infrastructure, and collaborating with stakeholders, businesses can improve their competitiveness while contributing to sustainability goals. Second, while the transition to a circular economy presents challenges and barriers, such as regulatory constraints, technological limitations, and consumer behavior, these barriers can be overcome through strategic planning, collaboration, and innovation. By proactively addressing these challenges, companies can unlock opportunities for long-term growth, resilience, and sustainability. In conclusion, the transition to a circular economy in supply chain management represents a transformative opportunity for businesses to create value, reduce waste, and promote sustainability. By making the circular economy a guiding principle and adopting a holistic approach to supply chain management, companies can contribute to a more sustainable and resilient future for all.(Groenewald et al., 2024).

Research on halal supply chains has shown significant progress in recent years, particularly in the integration of sustainability. Putri et al., in a comparative study of the development of halal supply chain research in Indonesia, emphasized that sustainability issues have begun to become a dominant theme in halal supply chain research, particularly in the food and beverage industry. This study highlights that halal supply chains are no longer understood solely as sharia compliance, but also encompass environmental, social, and governance dimensions as part of a long-term business strategy.(Putri et al., 2024).

In line with this, Sunarta and Apriliani emphasize the importance of an integrative strategy in halal supply chain management that balances operational efficiency, compliance with halal principles, and sustainability demands. Their research shows that organizations that are able to integrate sustainability into their halal supply chain strategies tend to have greater competitiveness and stronger consumer trust, particularly in the food and beverage sector.(Sunarta et al., 2025).

A focus on the principle of monotheism underpins Sharia compliance at every stage of the supply chain, establishing standards that all entities must adhere to. Justice ensures halal integrity by avoiding fraud and cross-contamination and protecting consumer rights. The principle of trust plays a crucial role in upholding transparency and accountability, enabling consumers to access clearer product information. The principle of maslahah (benefit) is grounded in food safety and product quality, protecting consumers from Sharia and health risks. The principle of mizan (benefit) integrates ecological sustainability into halal supply chain practices. Thus, this study demonstrates that the existence of Islamic economic philosophy not only provides a normative foundation but also serves as a guide for stakeholders to more effectively enhance transparency, accountability, and utilize digital technology, thereby enhancing consumer trust and supporting the sustainable and competitive growth of HSC in Indonesia.(Jannah et al., 2025).

From a scientific mapping perspective, Fajrah, through a bibliometric analysis of the sustainable halal supply chain, shows that global and national research trends are increasingly moving toward the integration of the halal supply chain and sustainability concepts. This study identified integration strategies, sustainable performance, and supply chain governance as key themes that will continue to develop over the 2020–2025 period.(Fajrah et al., 2025).

Furthermore, Ramdani links the development of the halal industry, including the halal supply chain, to the achievement of the Sustainable Development Goals (SDGs). This research confirms that integrating sustainability into the halal supply chain directly contributes to sustainable development goals, such as responsible consumption and production, inclusive economic growth, and environmental protection.(Ramdan et al., 2025).

The mixed model method conducted by Rakhmasari and Dharmayanti produced a conceptual model for developing the implementation of sustainable halal supply chain integration in the food and beverage sector in Indonesia through an analysis of Strengths, Weaknesses, Opportunities, Threats, and the formulation of alternative development strategies. By using the mixed method of the Embedded Design model, the SWOT analysis method from the IFE, EFE, IE matrices, and continued with the QSPM matrix,

the priority strategies for developing the implementation of sustainable halal supply chain integration in the food and beverage sector in Indonesia were obtained, namely: 1) Development of a Halal-Green Supply Chain Ecosystem for Export Acceleration, 2) Implementation of a Digital Traceability System (Blockchain) for Halal Integrity Assurance, 3) Strengthening the Upstream Supply Chain through Innovation of Local Raw Materials & Sharia Financing, and 4) Revitalization of Halal Logistics Infrastructure & Improvement of Human Resource Competence. From the formulation of alternative development strategy priorities, a conceptual model can be described for developing the implementation of sustainable halal supply chain integration in the food and beverage sector in Indonesia, which involves various stakeholders, with the main critical activities that need to be prioritized. (Rakhmasari & Dharmayanti, 2025)

Meanwhile, Prayitno highlighted trends in halal food and food safety for the 2021–2025 period, emphasizing the role of technology in strengthening transparency and traceability in the halal supply chain. This research shows that the use of digital technologies, such as traceability systems and halal information, has the potential to support the integration of sustainability into the halal supply chain, particularly in maintaining quality, food safety, and consumer trust.(Prayitno et al., 2025).

Sustainability Integration

Sustainability integration is an approach that incorporates sustainability principles into all decision-making processes, strategies, operations, and policies of an organization, so that economic, social, and environmental goals can be achieved in a balanced and sustainable manner over the long term. Sustainability is not seen as an add-on program, but rather as a core strategy of the organization's system.

The theory of sustainability has been a topic of discussion for quite a long time, from period to period until now, because each idea has not been realized optimally, so subsequent theories will emerge.

Sustainable Development Theory

According to the Brundtland Report: "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." This theory emphasizes:

1. Intergenerational justice
2. Wise management of resources
3. Long-run equilibrium

The Three Main Pillars of Development are not only seen from an economic perspective, but must balance three dimensions:

a. Economic growth
b. Environmental protection
c. Social justice (Brundtland, 1987).

These three pillars provide a balance in today's modern world, where economic activity with diverse models and objectives tends to neglect the public interest and prioritize personal or group gain. If society focuses solely on economic growth and neglects environmental protection and social justice, sustainability will undoubtedly be unattainable and will weaken future generations.

Triple Bottom Line (TBL)

John Elkington suggests that sustainability must integrate three dimensions, including:

1. People (Social), in this case, sustainability must be oriented towards the welfare of the ecosystem, the realization of justice, and the creation of social inclusion.
2. Planet (environment), in this case, sustainability must be oriented towards protecting ecosystems, efficient use of resources, and efforts to reduce waste.
3. Profit (economic), in this case, sustainability must be oriented towards financial sustainability and economic added value(Elkington, 1998).

Sustainability integration means that these three aspects must be considered simultaneously, not separately, because if we only focus on one aspect, sustainability will not be realized.

Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 serve as a global guideline for achieving sustainable development by 2030. The SDGs consist of 17 goals and 169 targets covering various aspects of sustainable development, including poverty alleviation, environmental protection, and community empowerment.(Diaz-Sarachaga, 2019).

The 17 goals are: No Poverty, Zero Hunger, Good Health & Well-Being, Quality Education, Gender Equality, Clean Water & Sanitation, Affordable & Clean Energy, Decent Work & Economic Growth, Industry, Innovation and Infrastructure, Reduced Inequalities, Sustainable Cities & Communities, Responsible Consumption & Production, Climate Action, Life Below Water, Life on Land, Peace, Justice and Strong Institutions, Partnerships for the Goals(Hoelman et al, 2015)

HoweverSustainable development in the 21st century also faces various challenges. One major challenge is the imbalance between economic growth and environmental protection. Uncontrolled economic growth can lead to serious environmental damage, such as climate change, biodiversity loss, and environmental pollution.

Forms of Sustainability Integration

Sustainability integration can be carried out at several levels, including:

1. Strategic Integration

Sustainability is a long-term strategy because it's not limited to a specific period but extends into the future. Setting sustainability goals based on ESG (Environmental, Social, and Governance) is a concept relevant to widely used management systems. In fact, ISO 14001 Environmental Management Systems and ISO 45001 Occupational Health and Safety Management Systems can work effectively when integrated with ESG.

ESG is a set of guidelines that companies seeking to invest must implement, taking into account environmental, social, and governance aspects. ESG was first introduced in the 2004 "Who Cares Wins" report by a group of financial institutions at the invitation of the United Nations Global Compact. This report is considered the first mention of ESG in a modern context. Several organizations, such as the Global Reporting Initiative (GRI), provide frameworks and standards for ESG reporting.

ESG implementation offers several benefits that overlap with ISO 14001 and ISO 45001, including improved risk management, operational efficiency, increased competitiveness, and enhanced employee engagement. Furthermore, integrating ESG and ISO will provide additional benefits such as improved access to capital. Companies that prioritize ESG are more likely to gain access to capital from sustainability-focused investors.(ESG Integration In ISO 14001 & ISO 45001-Professional Consultant, nd).

2. Operational Integration

Company operations have a large responsibility that must be carried out if the sustainability of the business can be maintained or run well, including:

a. Green Production

It is a production system that integrates sustainability aspects into the entire product life cycle, from raw material extraction to the post-consumption stage, to minimize negative impacts on the ecosystem.(What is Environmentally Friendly Technology?, nd). The following are the main components of environmentally friendly production based on the latest developments until the end of 2025:

b. Life Cycle Assessment Principles

Production does not only focus on factory efficiency, but also considers:

1) Raw Materials: Use of renewable, recycled, or environmentally friendly materials.
2) Efficient Process: Use of energy-saving technologies and a drastic reduction of carbon emissions to combat climate change.
3) Post-Use: Design products that are biodegradable or can be recycled back into new raw materials (circular economy).

c. Technology and Innovation 2025

By 2025, the adoption of clean technology will be increasingly massive, including:

1) Renewable Energy: Integration of solar panels and biomass energy in manufacturing processes.
2) Green Digitalization: The use of real-time carbon emission monitoring applications and a dedicated green product marketplace to support a sustainable lifestyle.

3) Waste-to-Energy: Utilizing production waste as a renewable energy source through environmentally friendly technology.(What is Environmentally Friendly Technology?, nd).

d. Regulatory Framework in Indonesia (2025 Update)

The government has tightened production standards through several recent policies:

1) Presidential Decree No. 109 of 2025: Regulates waste management into renewable energy based on environmentally friendly technology.
2) Minister of Environment Regulation No. 11 of 2025: Establishes new, stricter standards for domestic and industrial wastewater quality.
3) PP No. 26 of 2025: Concerning Environmental Protection and Management Planning as a national guideline(Life, nd).

e. Benefits for Business

Companies that implement environmentally friendly production in 2025 will gain competitive advantages, including:

1) Cost Efficiency: Operational savings through energy efficiency and waste reduction.
2) Access to Capital: Compliance with global ESG standards makes it easier for companies to secure investment from international investors.
3) Brand Reputation: Meeting the demands of consumers who are now more selective in choosing sustainable products(Sustainability-Based Digital Business Opportunities 2025 | Berijalan Techno Center - Berijalan, nd).

f. Energy and Resource Efficiency

Energy efficiency focuses on reducing energy waste through better technology and management.('Energy Efficiency', nd).

1) Mandatory Energy Management: Through ESDM Regulation No. 8 of 2025, the industrial sector is now required to implement an energy management system (such as ISO 50001) to optimize electricity and fuel use.
2) Energy Audits: The government, through ESDM Ministerial Regulation No. 3 of 2025, is tightening oversight through periodic energy audits. Compliant companies can receive incentives in the form of training and competency certification facilitation.

3) Energy Mix Target: Although the 2025 New, Renewable Energy (NRE) mix target was revised to around 17–20% (from 23%), efficiency remains a key pillar for achieving decarbonization. The NRE mix realization in the first half of 2025 reached 16%.(Regulation of The Minister Of Energy And Mineral Resources, nd).

g. Zero Waste and Circular Economy

Zero Waste and Circular Economy are two complementary concepts in resource management to achieve environmental sustainability.

1) Zero Waste

Zero waste is a philosophy and lifestyle that aims to eliminate or minimize the production of waste sent to landfills (TPA) or incinerators.

(a) Main Focus: Waste prevention through redesign of production and consumption systems so that all products can be reused, composted, or recycled.

(b) Indonesia's 2025 Target: The government is targeting a clean Indonesia with waste by reducing waste by 30% and managing waste by 70% by 2025.

(c) Lifestyle: Encourage people to reduce the use of disposable goods and adopt a reuse system.(Zero Waste Lifestyle (Solution For Waste Accumulation Towards A Life Without Waste) | Department of the Environment, nd).

2) Circular Economy

Circular economy is an economic system model that focuses on the repeated use of resources to extend the product life cycle.

(a) Basic Principle: Replacing the linear model (“take-use-dispose”) with a circular system through strategies of sharing, renting, repairing, and recycling materials.

(b) Objective: To keep the material of economic value in the system as long as possible without degrading its quality.

(c) Latest Regulation (2025): The government issued Presidential Decree No. 109 of 2025, which facilitates the processing of waste into renewable energy (waste-to-energy) as part of the implementation of the national circular economy.

3. Integration of Policy and Governance

a. Ethical and compliance standards

Ethical standards are a set of values, moral principles, and norms of behavior that serve as guidelines for individuals and organizations to act correctly, fairly, and responsibly.

Compliance standards are rules, procedures, and mechanisms that ensure that all organizational activities comply with applicable laws, regulations, and internal policies.

b. Sustainability reporting

Sustainability reporting is the process of preparing and submitting reports that reveal an organization's performance, impacts, and commitments to economic, social, environmental, and governance aspects, as a form of accountability to stakeholders.

Halal supply chain

Sulaiman et al. stated that six main components are very important to achieve an integrated halal supply chain system. These components are: (1) Human resources, (2) Process, (3) Environment, (4) Accreditation, (5) Logistics services, (6) Traceability system. Figure 1 shows that there is a committee that evaluates all components of the halal supply chain that have been implemented by the company. Members of the integrated halal supply chain committee must be Muslim professionals in various fields such as human resources, manufacturing processes, environment, accreditation, logistics, and traceability technology. These members will also evaluate each component of the supply chain to determine whether it meets halal standards or not.(Rohaeni & Sutawijaya, 2020).

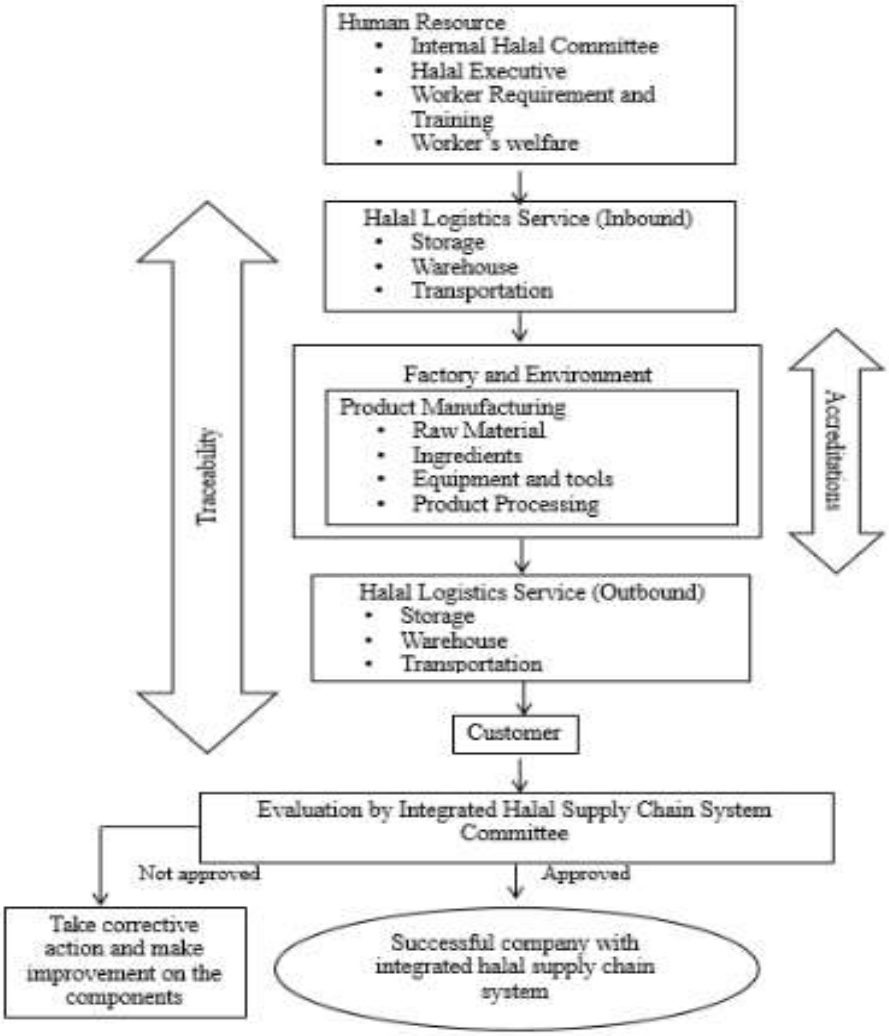

Figure 1. Integrated Halal Supply Chain System Model(Sulaiman et al., 2018)

Zero-waste Supply Chain

Zero-waste supply chain is a supply chain strategy that:

1. Minimize resource usage
2. Eliminate waste in production and distribution processes
3. Optimizing the use of leftover materials
4. Integrating the principles of a circular economy

The main target is not just to reduce waste, but to prevent waste in the first place (waste prevention).(Çınar, 2024).

1. The Key Principles of a Zero-Waste Supply Chain

a. Reduce; Reduce excess raw materials, energy, and packaging.

b. Reuse: Reusing materials, packaging, or by-products.

c. Recycle; Recycle materials so they can be reused in the production process.

d. Recover: Taking the value of the remaining process (energy, derived materials, or by-products).

e. Redesign: Redesign products and processes to minimize waste from the start.

2. Zero-Waste Stages in the Supply Chain

a. Procurement

1) Choosing environmentally friendly suppliers
2) Sustainable and recyclable raw materials
3) Environmental standards-based supplier contracts

b. Production

1) Clean production
2) By-product utilization
3) Energy and water efficiency

c. Packaging

1) Minimalist packaging
2) Biodegradable or reusable materials
3) Returnable packaging system

d. Distribution and Logistics

1) Delivery route optimization
2) Load consolidation
3) Low-emission transportation

e. Reverse Logistics

1) Return of product, packaging, or remaining materials
2) Recycling and reuse
3) Economically valuable waste processing(Costello, 2019)

3. Benefits of a Zero-Waste Supply Chain

a. Environment

1) Reduce pollution

2) Reducing carbon emissions

3) Saving natural resources

b. Economy

1) Production cost efficiency

2) Added value from waste

3) Long-term competitiveness

c. Social and Ethical

1) Positive corporate image

2) Compliance with environmental regulations

3) Supporting sustainable development (SDGs)(Liu et al., 2024).

RESEARCH METHODS

This research uses a qualitative approach to examine natural objects, with the researcher acting as the primary instrument, while data collection was conducted using a combination of techniques (observation, interviews, and documentation). Data analysis is inductive, focusing more on emphasizing the meaning of the qualitative research results, understanding uniqueness, constructing phenomena, and developing hypotheses.(Sugiyona, 2022)

As for the typesThis research is an exploratory case study, because it explores in depth UD. WND Food regarding the legitimacy process in the context of sustainability standards by using an abductive research strategy (drawing the most reasonable assumptions or explanations from the observed facts or phenomena, even though the explanation is not necessarily correct).(Kusnezowa & Vang, 2021)The importance of an exploratory approach is to answer the questions “how” and “why” in social research.(Malsinghe et al., 2022)

The determination of the research subjects uses a purposive technique, namely a technique where data sources are selected based on certain considerations.(Sugiyono, 2022) Namely, the owner of UD. WND Food, workers washing ingredients, workers in

charge of cooking, and workers packaging. Data collection was conducted through observation, interviews, and documentation. Data analysis through data collection, data condensation, data presentation, and conclusion.(Miles et al., 2014)The validity of the data was established by triangulating sources, namely comparing information from several informants selected purposively, and technical triangulation, namely comparing data using interview, observation, and documentation techniques.(Sugiyono, 2022)

RESULTS AND DISCUSSION

1. Integration of Halal Principles with Environmental Ethics in the Food Industry Supply Chain in Jember

The results of the research and analysis above show that the owner of UD. WND Food really understands the integration of halal principles starting from the procurement of materials, production processes, packaging, and prioritizes the importance of having a halal certificate, this is because it is supported by the experience of managing a business for a long time and the educational background and religious background she has, Mrs. Mu'ayadah is a bachelor's degree graduate from an Islamic college.

Regarding environmental ethics, he is also very careful and fully aware of the existence of his business, which is also a source of employment for his neighbors and relatives, so he must be careful about environmental discomfort.

What is the owner of UD. WND Food has done is very much in line with the Triple Bottom Line (TBL) sustainability principle.(Elkington, 1998)which must integrate three dimensions: social, environmental, and economic, to achieve sustainability. This is also in line with research by Putri et.al., which states that the halal supply chain is no longer understood solely as sharia compliance, but also includes environmental, social, and governance dimensions as part of a long-term business strategy (Putri et.al. 2024). Therefore, what the owner of UD. WND Food has also implemented the correct behavior of a Muslim producer, in the sense of adapting to Sharia requirements, namely, providing maslahah.

2. Strategies Implemented to Improve Logistics Efficiency in the Halal Supply Chain

The improvement of logistics efficiency carried out by UD. WND Food is partnering with raw material suppliers, including PT. Mitra Tani Dua Tujuh, which is a supplier of export-quality boiled edamame and a producer of quality coconut oil brand "Dorang", thus facilitating the acquisition of raw materials and saving the budget, because by partnering, the prices given by raw material suppliers are automatically much cheaper than normal prices. What has been done by UD. WND Food is relevant to the Sustainable Development Goals (SDGs), especially Goal 17, namely partnership. to achieve goals (partnership to achieve goals)(Hoelman et al., 2015). Different from researchElma Sibonghanoy Groenewald et.al., improving logistics efficiency is achieved by implementing *Circular*Economy in its supply chain management. (Groenewald et al., 2024)HoweverThis is in line with research conducted by Ramdani, which links the development of the halal industry, including the halal supply chain, with the achievement of the Sustainable Development Goals (SDGs). (Ramdani, 2025).

UD. WND Food, which is still classified as a micro, small, and medium enterprise (MSME), can partner with a large company like PT. Mitra Tani Dua Tujuh, which is an excellent breakthrough. This will significantly increase UD. WND Food has opportunities to become a leading food industry company that will make a greater contribution to the economic development of the surrounding community.

3. Zero Waste Supply Chain Concept Applied in the Halal Food Industry

The responsibility as a producer to consistently maintain the quality of raw material supplies to produce quality products, as well as to properly manage production waste, demonstrates that the concept of a zero-waste supply chain is an obligation to maintain business sustainability. In this regard, what UD. WND Food has done is highly relevant to SDG 12 (responsible consumption and production).(Hoelman et al., 2015)This is also in line with previous research, which explains that the integration of sustainability in the halal supply chain directly contributes to sustainable development goals, such as responsible consumption and production, inclusive economic growth, and environmental protection (Ramdani, 2025).

The above indicates that the owner of UD. WND Food has a good personal awareness, because with today's increasingly fierce business competition, many business owners ignore their environmental responsibilities regarding waste for the sake of profit alone.

4. Barriers and Opportunities in Implementing a Sustainable Halal Supply Chain

Research data shows that UD. WND Food lacks access to halal certification. Halal product assistants still interact with external parties, such as the Food and Food Product Supervisory Agency (PPH) in Malang, even though PPH in Jember has expanded its reach to other regions. This demonstrates a lack of literacy regarding halal certification and could also be a criticism of PPH's lack of comprehensive outreach in Jember for halal product assistance.

Regarding production capacity limitations, this is a common obstacle in the MSME industry. However, despite high market demand, it is often overwhelmed by the challenges of meeting it, UD. WND Food has demonstrated its commitment to providing excellent customer service, as evidenced by working overtime during off-hours, such as overnight hours and Sundays.

UD. WND Food's halal certification presents marketing opportunities due to increased consumer awareness of the halal label, thereby expanding its market reach. Maintaining the quality of the halal supply chain is part of consumer protection. This aligns with the theory of sustainable development, which has three main pillars. Development should not be viewed solely from an economic perspective but must balance three dimensions: economic growth, environmental protection, and social justice.(Brundtland, 1987)

CONCLUSION

UD. WND Food is a small example of a food industry committed to running its business by implementing halal principles, environmental ethics, logistical efficiency, and zero waste, which are integrated to achieve maximum business sustainability. And

contribute significantly to the economic welfare of the surrounding community. The objectives of this research have been answered well and are in line with the concept of sustainability integration. From UD. WND Food, which is at the MSME level, can become a role model for other food MSMEs and, at a larger scale, namely food companies.

The limitation of this research is that the research object has a small scope, namely UD. WND Food, which is still classified as an MSME, so that the contribution related to the concept of sustainability integration that has been applied does seem easier when compared to large companies; however, the results of the commitment to continue applying the concept of sustainability integration in the halal supply chain do not rule out the possibility of UD. WND Food is becoming a large food industry at the corporate level.

REFERENCES

Apa Itu Teknologi Ramah Lingkungan? Definisi dan Manfaatnya | XL SATU. (n.d.). Retrieved 16 December 2025, from https://satu.xl.co.id/berita-dan-artikel/pengertian-teknologi-ramah-lingkungan

Brundtland, G. H. (1987). Our Common Future. *World Commission on Environment and Development (WCED)*.

Çınar, D. (2024). An Overview Of Zero Waste Supply Chain. *Uluslararası Batı Karadeniz Sosyal ve Beşeri Bilimler Dergisi*, *8*(2), 262–279. https://doi.org/10.46452/baksoder.1572222

Costello, C. (2019). The concept of Zero Waste. In *Saving Food* (pp. 369–391). Elsevier. https://doi.org/10.1016/B978-0-12-815357-4.00013-4

David, F. R., David, F. R., & David, M. E. (2020). *Strategic management: Concepts and* cases*, a competitive advantage approach* (Seventeenth edition). Pearson.

Diaz-Sarachaga, J. M. (2019). Analysis of the Local Agenda 21 in Madrid Compared with Other Global Actions in Sustainable Development. *International Journal of Environmental Research and Public Health*, *16*(19), 3685. https://doi.org/10.3390/ijerph16193685

Efisiensi *Energi*. (n.d.). *IESR*. Retrieved 16 December 2025, from https://iesr.or.id/efisiensi-energi/

Elkington, J. (1998). *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*. New Society Publishers.

Fitrah, M., & Luthfiyah. (2017). *Metodologi Penelitian: Penelitian Kualitatif, Tindakan* Kelas *Dan Studi Kasus* (Cet 1, p. 44). CV. Jejak.

Groenewald, E. S., Jaramillo, M. T. E., Garg, A., & Pipalia, K. D. (2024). Circular Economy Strategies in Supply Chain Management: Towards Zero Waste. *Power System Technology*, *48*(1), 464–480. https://doi.org/10.52783/pst.291

Hadi, A. (2023). Implementation of the Law for the Implementation of Halal Product Assurance in the Industrial Revolution. In F. Kerem Giray, H. Glaser, & S. Endah Wahyuningsih (Eds), *Proceedings of the 5th Legal International Conference and Studies (LICS 2022)* (Vol. 754, pp. 30–38). Atlantis Press SARL. https://doi.org/10.2991/978-2-38476-074-9_5

Hidup, K. L. (n.d.). *Presiden Tetapkan Perpres 109/2025: Langkah Nyata Atasi Sampah Perkotaan | Kementerian Lingkungan Hidup / Badan Pengendalian Lingkungan Hidup*. Presiden Tetapkan Perpres 109/2025: Langkah Nyata Atasi Sampah Perkotaan | Kementerian Lingkungan Hidup / Badan Pengendalian Lingkungan Hidup. Retrieved 16 December 2025, from https://kemenlh.go.id/news/detail/presiden-tetapkan-perpres-1092025-langkah-nyata-atasi-sampah-perkotaan

Hoelman et al, M. B. (2015). *Panduan SDGs Untuk Pemerintah Daerah (Kota dan Kabupaten) dan Pemangku Kepentingan Daerah* (pp. 1–64). International NGO Forum on Indonesian Development.

https://www.databridgemarketresearch.com, D. B. M. R. (n.d.). *Indonesia Halal Market* Report *Size, Share, and Trends Analysis Report – Industry Overview and Forecast to 2032 | Data Bridge Market Research*. Retrieved 15 October 2025, from https://www.databridgemarketresearch.com/reports/indonesia-halal-market

Indonesia Halal Food & Beverage Market Forecast 2023-2030. (n.d.). *Inkwood Research*. Retrieved 15 October 2025, from https://www.inkwoodresearch.com/reports/indonesia-halal-food-and-beverage-market/

Indonesia Halal Food Market Size, Share & Demand (2025-2031) | BlueWeave. (n.d.). *Retrieved* 15 October 2025, from https://www.blueweaveconsulting.com/report/indonesia-halal-food-market

Indrajit, R. E. (2013). Manajemen Strategis Model Hunger-Wheelen. *E-Artikel Sistem Dan Teknologi Informasi*, *Seri 999*, 1–4.

Integrasi ESG dalam ISO 14001 & ISO 45001-Konsultan Profesional. (n.d.). Retrieved 16 December 2025, from https://trustmandiri.com/mengintegrasikan-esg-ke-dalam-iso-14001-dan-iso-45001-pendekatan-konsultan-profesional/

Iskandar, Y. A., Vikaliana, R., Irawan, A., & Putri, N. A. (2025). Rantai Pasok Hijau dan Halal sebagai Strategi Pengembangan Pariwisata Berkelanjutan di Desa Wisata Alamendah. *IKRA-ITH ABDIMAS*, *9*(3).

Jannah, M., Iska, S., Hidayati, A., Putri, S., & Marlion, F. A. (2025). Eksistensi Filsafat Ekonomi Islam Terhadap Penguatan Halal Supply Chain Di Indonesia. *Jurnal Ilmiah Falsafah: Jurnal Kajian Filsafat, Teologi dan Humaniora*, *11*(2), 64–74.

Khan, S., Haleem, A., & Khan, M. I. (2021). Risk management in Halal supply chain: An integrated fuzzy Delphi and DEMATEL approach. *Journal of Modelling in Management*, *16*(1), 172–214. https://doi.org/10.1108/JM2-09-2019-0228

Kusnezowa, D., & Vang, J. (2021). Creating Legitimacy in the ISO/CEN Standard for Sustainable and Traceable Cocoa: An Exploratory Case Study Integrating Normative and Empirical Legitimacy. *Sustainability*, *13*(22), 12907. https://doi.org/10.3390/su132212907

Liu, D., Yousaf, Z., & Rosak-Szyrocka, J. (2024). Environmental Performance Through Green Supply Chain Management Practices, Green Innovation, and Zero Waste Management. *Sustainability*, *16*(24), 11173. https://doi.org/10.3390/su162411173

Lozano, R. (2015). A Holistic Perspective on Corporate Sustainability Drivers. *Corporate Social Responsibility and Environmental Management*, *22*(1), 32–44. https://doi.org/10.1002/csr.1325

Malsinghe, M. T. D., Gunathilaka, M. H. A., Dinesh Bandara, I. P. C., Wijerathne, A. I., Nagendrakumar, N., & Madhavika, W. D. N. (2022). Sustainable Supply Chains of Sri Lankan Manufacturing Organizations: A Study on Operational *Excellence* Models During the COVID-19 Pandemic. *Operations and Supply Chain Management: An International Journal*, 228–239. https://doi.org/10.31387/oscm0490343

Miles, M. B., Hubberman, M., & Saldana, J. (2014). *Qualitative Data Analysis A Methos Sourcebook', 3rd ed*. SAGE Publications.

Mohamed, Y. H., Abdul Rahim, A. R., & Ma'aram, A. (2020). The effect of halal supply chain management on halal integrity assurance for the food industry in Malaysia. *Journal of Islamic Marketing*, *12*(9), 1734–1750. https://doi.org/10.1108/JIMA-12-2018-0240

Ni'matuzahroh, & Prasetyaningrum, S. (2018). *Observasi Teori Dan Aplikasi Dalam Psikologi'* (p. 4). Universitas Muhammadiyah Malang.

Peluang Bisnis Digital Berbasis Sustainability 2025 | Berijalan Techno Center— Berijalan. (n.d.). Retrieved 16 December 2025, from https://berijalan.co.id/article-detail/peluang-bisnis-digital-berbasis-sustainability-2025-berijalan-techno-center

Peraturan Menteri Energi Dan Sumber Daya Mineral. (n.d.).

Porter, M. E. (2008). The Five Competitive Forces That Shape Strategy. *Harvard* Business *Review*, *86*(1), 78–93.

Prayitno, S. A., Amirudin, N., Islami, A. A. N., & Yunus, T. (2025). Halal Food and Safety Treands in 2021-2025 Era. *Academic Letters*, *1*(3), 47–52.

Putri, A. S., Susilo, N. R., Sakti, A. Y. N., & Wicaksana, D. E. P. (2024). The Development of Halal Supply Chain Research in Indonesia: A Comparative Study.

Jurnal Teknik Industri, *25*(2), 97–118. https://doi.org/10.22219/JTIUMM.Vol25.No2.97-118

Rakhmasari, A. A., & Dharmayanti, I. (2025). Analisis Integrasi Rantai Pasok Halal Berkelanjutan Pada Sektor Makanan Dan Minuman Di Indonesia. *Prosiding Seminar Nasional Manajemen Industri Dan Rantai Pasok 6th, Tangerang 2025*, *6*(1).

Ramdan, Munir, M. B. B., Kurniawan, T., Fahmi, M. F., Suryaningsih, S. A., & Musafak, M. (2025). Linking Halal Industry To Sustainable Development. *International Conference of Islamic Economics and Business (ICONIES 2025)*, *11*(1), 1285–1292.

Rohaeni, Y., & Sutawijaya, A. H. (2020). Pengembangan Model Konseptual Manajemen Rantai Pasok Halal Studi Kasus Indonesia. *J@ti Undip : Jurnal Teknik Industri*, *15*(3), 177–188. https://doi.org/10.14710/jati.15.3.177-188

Schaltegger, S., Lüdeke-Freund, F., & Hansen, E. G. (2016). Business Models for Sustainability: A Co-Evolutionary Analysis of Sustainable Entrepreneurship, Innovation, and Transformation. *Organization & Environment*, *29*(3), 264–289. https://doi.org/10.1177/1086026616633272

Sugiyona. (2022). *Metodologi Penelitian Kualitatif* (3rd edn, pp. 9–10). Alfabeta.

Sugiyono. (2022). *Metodologi Penelitian Kualitatif* (3rd edn, p. 94). Alfabeta.

Sulaiman, S., Aldeehani, A., & Aziz, F. A. (2018). Integrated halal supply chain system in food manufacturing industry. *Journal of Industrial Engineering Research*, *4*(3), 1–5.

Sunarta, D. A., Apriliani, R., Prasetya, A., & Ramadhaningsih, D. (2025). Halal Certification and Value Addition for MSME Products: A Literature Review on Government Initiatives and Regulatory Frameworks. *Malacca: Journal of Management and Business Development*, *2*(2), 104–115. https://doi.org/10.69965/malacca.v2i2.185

Tieman, M. (2011). The application of Halal in supply chain management: In-depth interviews. *Journal of Islamic Marketing*, *2*(2), 186–195. https://doi.org/10.1108/17590831111139893

Zailani, S., Jafarzadeh, S., Iranmanesh, M., Nikbin, D., & Selim, N. I. I. (2018). Halal logistics service quality: Conceptual model and empirical evidence. *British Food Journal*, *120*(11), 2599–2614. https://doi.org/10.1108/BFJ-07-2017-0412

Zero Waste Lifestyle (Solusi Penumpukan Sampah Menuju Kehidupan *Tanpa Limbah)* | *Dinas Lingkungan Hidup*. (n.d.). Retrieved 16 December 2025, from https://dlh.bulelengkab.go.id/informasi/detail/artikel/37_zero-waste-lifestyle-solusi-penumpukan-sampah-menuju-kehidupan-tanpa-limbah