Incorporating Green and Sustainability Criteria (G&S) into Malaysia's Halal Certification Framework for the Poultry Sector

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ABSTRACT

This study investigates whether Green and Sustainability (G&S) criteria can be practically incorporated into Malaysia's halal poultry framework. A qualitative case study on Company A was conducted, since Company (A) is focused on one of the largest poultry industries in Malaysia. Primary data were collected through a series of semi-structured interviews, site observations, while secondary data were gathered through document analysis across five operational divisions: breeding, animal feeding, animal housing, animal transport and slaughterhouse. Using the European Farm to Fork (F2F) Strategy (2020) as a directional guide for sustainable livestock across environmental, social, and economic pillars, the findings reveal distinct opportunities for regulatory improvement. Although sectoral guidelines exist, such as MS 1500:2019, Good Animal Husbandry Practice MS2027:2018, Malaysian Good Agricultural Practices (MyGAP), and the Environmental Quality Act 1974, there remains room for cross-agency policy alignment to incorporate G&S criteria into Malaysia's poultry sector halal certification.

Keywords: Halal Certification Framework, Green & Sustainability (G&S), European Farm to Fork (F2F, 2020) Strategy, Malaysia's Poultry Sector

INTRODUCTION

Green and Sustainability (G&S) practices have evolved into a mandatory requirement for food producers within the European Union (EU). The 'European Farm to Fork Strategy' (2020) framed under the European Green Deal (2019), establishes a policy framework designed to ensure that the EU's food system-whether produced locally or sourced internationally is fair, healthy and environmentally friendly (European Commission, 2020; Schebesta and Candel, 2020).

Malaysian poultry products operate on the principle of halal-toyyiban (lawful and wholesome). However, a fundamental limitation is that existing regulatory instruments and institutional alignments emphasises operational hygiene, and Shariah compliance over G&S practices. First, halal certification for livestock, which sits under the Department of Islamic Development Malaysia (JAKIM), rests on MS 1500:2019; its guidelines concentrate on the slaughtering process, premises, logistics, raw materials, processing, transport, packaging, personnel hygiene, and religious practices and sanitation. Second, Good Animal Husbandry Practice is governed by MS 2027:2018. Thirdly, the Malaysian Good Agricultural Practice (MyGAP) scheme for livestock, is administrated by the Department of Veterinary Services (DVS) under the Ministry of Agriculture and Food Security (MAFS) and the Environmental Quality Act 1974 under the Department of Environment (DOE).

For small- and medium-scale producers, this friction translates into heavy compliance barriers, high operational costs, and complicated documentation requirements that discourage MyGAP registration. Furthermore, official policies tailored to Green and Sustainability (G&S) practices in halal poultry create room for improvements. Although the Malaysian Halal Management System (MHMS) 2020 tightens internal facility controls, explicit G&S metrics still has the room for improvements.

In 2025, Malaysia focused on exporting halal-certified poultry and processed meats to South East Asian markets, including Singapore (RM827 million), Vietnam (RM42.1 million), Brunei (RM6.01 million), Myanmar

(RM2.65 million), and Thailand (RM2.09 million) (The Observatory of Economic Complexity, 2025). Although Malaysian halal poultry has not yet entered the EU market, the EU regulatory direction presents a clear mandate to integrate G&S criteria into global food production. Malaysian products could embed environmental stewardship, sustainable sourcing, and waste management within MS1500:2019 (Ab Rashid and Bojei, 2019; JAKIM, 2020). This G&S integration would provide an opportunity for Malaysian poultry producers to improve their production systems. This would not only benefit the country's social, economic, and environmental landscape, but also transform poultry production to facilitate the global market expansion of local producers. To address these gaps, this study aims to answer the overarching research question: "How can green and sustainability (G&S) criteria be incorporated into Malaysia's halal certification framework for the poultry sector?"

LITERATURE REVIEW

2.1 Green and Sustainability (G&S) Criteria

Power et al. (2012) advocate that G&S can be developed based on five pillars: sustainable sourcing, improved land and water management, enhanced nutrition, effective technological use, and reduced commodity price volatility.

(a) Sustainable sourcing

According to Ecovadis (2017) and Goebel et al. (2012), sustainable sourcing is the integration of social, ethical, and environmental performance factors into the process of selecting suppliers and managing their relationships for long-term benefits. Ross et al. (2015) agree that many agri-food firms are incorporating sustainability initiatives into their business operations in response to internal and external requirements to achieve cost savings and waste reduction. Power et al. (2012) highlight that many companies impose certification schemes as a way to measure, report, and define sustainable farming, such as organic labels, Fairtrade, and the Rainforest Alliance.

(b) Improving land and water management

Power et al. (2012) advocate that land and water management could be enhanced through education and training to help farmers gain necessary skills for sustainable farming. Blevins (2013) echoes that the food industry employs trained food safety and regulatory compliance specialists alongside food scientists in order to innovate and collaborate within the food production industry to better manage land and water resources.

(c) Enhancing nutrition

As mentioned, the demand for animal products is increasing due to a growing population, economic shifts, and dietary changes. Zikeli et al. (2014) and Murdoch et al. (2016) note that green practices contribute to dietary changes as populations become more concerned about healthy food. Power et al. (2012) highlight the importance of providing affordable and nutritious food products for the world. This can be achieved through alliances between governments, society, and the private sector to address the three challenges of undernutrition, micronutrient deficiency, and over-nutrition.

(d) Effectively using technology

Technology can play an important role in enhancing G&S practices in livestock by optimising productive assets. The FAO (2002) and Van't Hooft et al. (2012) mention that the livestock sector is rapidly moving towards intensive and specialized systems in which the production environment is controlled and aimed at maximum productivity per animal. Olesen et al. (2000), Power et al. (2012), Shen et al. (2013), and Evans and Syed (2015) state that innovation and appropriate cost-effective technology are capable of improving sustainable livestock management, including reducing losses and improving distribution networks, market information, and green innovation (Frazer, 2008). Furthermore, using technology effectively in G&S practices can minimise waste, conserve energy, and improve operational and organisational procedures (Logaa and Zailani, 2013).

(e)Reducing commodity price volatility

According to Power et al. (2012), the way food is produced impacts the price fluctuations due to global flows in supply and demand, particularly as farmers cope with the weather and try to predict future demand. Hence, rising food prices have severely affected income distribution and poverty, especially in low-income economies. Through collaborative efforts, governments, the private sector, and civil society can contribute to reducing commodity price volatility by focusing on constructive policies and investments.

2.2 The EU Farm to Fork (F2F) Strategy

The F2F strategy aims to ensure sustainable food production; stimulate sustainable food processing, wholesale, retail, hospitality, and food services' practices; promote sustainable food consumption and facilitate the shift toward healthy, sustainable diets and reduce food loss and waste (EC, 2020a). The eight key quantitative targets of the F2F strategy to be reached by 2030 are: (a) Reducing the use and risk of chemical pesticides by 50%; (b) reducing the use of more hazardous pesticides by 50%; (c) reducing nutrient losses by at least 50% while ensuring no deterioration in soil fertility; (d) reducing fertilizer use by at least 20%; (e) reducing the sales of antimicrobials for farmed animals and in aquaculture by 50%; (f) increasing total farmland under organic farming to 25%; (g) reducing per capita food waste at retail and consumer levels by 50%; (h) EUR 10 billion under Horizon Europe (2021–2027) to be invested in Research and Innovation related to food, bioeconomy, natural resources, agriculture, fisheries, aquaculture, and the environment (EC, 2020b).

There are five key qualitative targets of the F2F strategy to be reached by 2030: (a) creation of a healthy food environment supporting healthy and sustainable food choices; (b) mandatory harmonised front-of-pack nutrition labelling; (c) sustainable food labelling framework that covers the nutritional, climate, environmental, and social aspects of food products; (d) collaboration with third countries and international actors to support a global move toward sustainable food systems; (e) support via EU Horizon Europe key funding programs for research and innovation (EC, 2020b).

2.3 Green and Sustainability Practices in Food Production and Management

Recently, many scholars have agreed that the global food production is under stress due to climate change, which causes food scarcity, alongside rapid population growth (Godfray et al., 2010; Swaminathan and Bhavani, 2013; Davis et al., 2016; Morone and Cottoni, 2016). At the same time, the shifting demand towards meat (animal-sourced protein) forced the producers to face the operational pressures stemming from insufficient natural resource availability (Davis et al., 2016) and escalating energy consumption (Costantino et al., 2016). Furthermore, livestock management faces local bottlenecks like rangeland degradation from droughts, feed shortages, water scarcity, animal diseases, predators, and complex communal land laws (Solomon et al., 2007).

Traditional livestock farming causes environmental, social, and economic impacts. Most of the environmental degradation comes from greenhouse gas (GHG) emissions, global warming, water pollution, and land degradation (Boye and Arcand, 2013; Leip et al., 2015). Oosterveer and Sonnenfeld (2012) together with Boye and Arcand (2013) explain that clearing land for farming disrupts biodiversity and drives deforestation, while over-fertilisation ruins the soil and heavy irrigation causes water shortages.

Data from the UN Food and Agriculture Organisation (FAO) 2023 show that, livestock production and supply chains are responsible for about 12% to 14.5% of global emissions (FAO, 2023). These numbers vary according to the region, but the emissions come from enteric fermentation on the farm, feed production, on-farm energy use, and transport (Leip et al., 2010; Paolotti et al., 2016; Rojas-Downing et al., 2017). Scholtz et al. (2013) point out that the livestock industry has a real chance to turn things around.

The ‘EU Farm to Fork Strategy' (2020) has set sustainable benchmarks for the agri-food system. This matches the view of the Animal Task Force (2013), which asserts that resource efficiency must be scaled up, thereby changing the ways we produce food to reduce the environmental implications while still feeding the world.

RESEARCH METHODS

This study aimed to answer the research question: "How can green and sustainability (G&S) criteria be incorporated into Malaysia's halal certification framework for the poultry sector?" A qualitative case study was conducted on Company (A), focused on one of the largest poultry industries in Malaysia. Primary data were collected through a series of semi-structured interviews, site observations, while secondary data were gathered through document analysis across five operational divisions: breeding, animal feeding, animal housing, animal transport and slaughterhouse.

DISCUSSION AND ANALYSIS

With a 30-year history of operating in halal broiler production and processing in Malaysia, Company A, which produces fully cooked chicken, chicken parts and freezer-to-fryer products, has improved its poultry production by adopting advanced technology into its feed mill, breeder farms, hatchery, and broiler farms. In addition, to enrich the findings on G&S implementation in Malaysia, primary data and secondary data from related agencies were obtained.

4.1 Poultry Industry Development in Malaysia

To examine poultry production progress in Malaysia, data were gathered from the official government agency documentation, specifically the National Agricultural Policy (NAP) (1984-2010) and the National Agrofood Policy (2011-2020), to map the chronological path of the Malaysian agriculture and livestock sectors, supported by respondent interviews. Historically, the NAP was executed in three phases: Phase 1 (1984 -1991); Phase 2 (1992-1997) and Phase 3 (1998-2010). Prior to the third phase, the Malaysian government transitioned to a food security paradigm by introducing the National Agrofood Policy 2011-2020 (Dardak, 2015).

The Third NAP steered the agricultural sector towards a G&S framework by deploying strategic approaches to increase productivity and competitiveness while utilising natural resources sustainably. The Third NAP strategies guided G&S development through resource optimisation, accelerated agro-based industrial growth, the enhancement of research and development, technological diffusion, fostering private sector investment, marketing structural reforms, expanded food production, human resource development, and cultivating self-reliant farmers and fishermen's institutions. The third NAP, remain focussing on the sufficiency of domestic supply of eggs and poultry meat.

When the 3rd NAP (2011-2020) superseded the previous framework, it shifted the focus towards sustainable food production systems, targeting nutritional optimisation, agricultural land infrastructure development and expansion, and compliance standards. The 3rd NAP prioritised developing a highly skilled labour force, to reduce the reliance on low-skilled manual labour in the agriculture sector.

Broiler production in Malaysia sustains its competitive edge by adopting automated systems, modern closed-house, and natural biosecurity agents like microorganisms (Nazmi et al., 2015). Besides, government incentives successfully mobilized private capital investment within the agricultural sector (Abu Dardak, 2015).

Following the 2013 introduction of the Malaysian Good Agricultural Practices (MyGAP) framework, the implementation of the Animal Welfare Act 2015, and halal integration by JAKIM; the Federation of Livestock Farmers' Associations of Malaysia (FLFAM) played a vital role in protecting animal welfare and expanding technical proficiency across commercial farms.

An officer from the Ministry of Agriculture's Agriculture Division explained that the MyGAP framework acts as a strategic rebranding initiative designed to replace three distinct legacy certificates: the Malaysian Farm Certification Scheme for Good Agricultural Practices (SALM), the Livestock Farm Practices Scheme (SALT), and the Malaysian Aquaculture Farm Certification Scheme (SPLAM). Consolidating these programs was intended to establish a single unified standard for local producers.

According to Cheng (2016), establishing MyGAP, encourages farmers to adopt modern commercial systems, boosting output yields, and strengthening the export competitiveness. Rabu et al. (2016) observed that MyGAP was designed in coordination with the Department of Standards Malaysia, which reinforced the validation mechanics of the scheme. For livestock operations, MyGAP is underpinned by Malaysian Standard MS2027:2018, which establishes auditing thresholds for herd health programs, biosecurity programs, premise infrastructure, veterinary medication usage, waste management and pollution control, and animal welfare.

An officer from the Agriculture Division, MAFS mentioned "*Farms are monitored, six months prior to the standard two-year certificate expiring, operators receive automated renewal alerts. This scheme minimises environmental stress, which enhances farm productivity."* Additionally, the Assistant Secretary from MAFS stated that, MyGAP application or auditing is free, although mandatory renewal is required every two years.

While farm management is bound by the Animal Welfare Act 2015, this act regulates animal transport and slaughter to prevent trauma and distress. Meanwhile, JAKIM enforces Halal regulations in poultry production and management based on MS1500:2019 Halal food production, preparation, handling and storage – general Guidelines). Developed through inter-agency collaboration between JAKIM, the Department of Veterinary Services, Standards Malaysia, the Ministry of Health, and SIRIM; MS1500:2019 governs abattoir setups, poultry processing plants, slaughtering, stunning methods, the dressing process, storage, and the transportation of Halal poultry and their products.

In reality, the halal process is part of green procedures. Mohamed Yunos et al. (2014) state that understanding halal principles reflects green paradigms; by securing hygiene, product quality, product safety, and handling purity, the process aligns with green supply chain principles. Halal protocols focus on the hygienic and safety parameters of food and its preparation; while green management focuses on reducing the negative impact of human activities towards the environment.

4.2 Green and Sustainability (G&S) Practices in Halal Poultry Production and Management in Malaysia

Malaysia NAPs' achieved its goal of ensuring an adequate domestic poultry supply. This system operates across multiple stages of the supply chain—including breeding, hatcheries, housing, feed mills, and processing plants—and is controlled by a central integrating firm (Umar Muazu et al., 2015). Within the domestic market, large poultry-processing companies operate as central integrating firms that exercise full ownership over breeder farms, feed mills, grower operations, and processing plants. These integrators supply contract growers with day-old chicks (DOCs), feed rations, and housing infrastructure. A hatchery division Quality Control manager explained: *"We have contract farmers all over Peninsular Malaysia and we signed an agreement with them."*

4.2.1 Breeding

Field data from Company A indicates that strict attention is paid to meat quality from the breeding phase. All respondents from Company A agreed that selecting the right breed at the beginning is very important in terms of the bioeconomy, as it helps reduce poultry mortality.

The Manager of the Breeder Division stated, "We have to select a good breed. We have to know the history of the chicken… where they come from… whether they can resist our weather… how long they can live." The officer added, "We import parent stock. Most of the breeds that we use are 90% Cobb and 10% Ross. The selection is based on demand and meets machinery sizes."

4.2.2 Animal Feeding

Local regulatory frameworks emphasis on upgrading feed ingredient nutrition and operational feeding materials. This priority is embedded across multiple national benchmarks, notably MS 20:2008 for poultry feed specifications, MS 2027:2018 for Good Animal Husbandry Practices (GAHP), and the Department of Veterinary Services' 2014 Guidelines for Good Manufacturing Practice (GMP) for Feed.

Under MS 20:2008, commercial feed specifications strictly govern nutritional profiles, ingredient quality, age-appropriate diet suitability, and packaging, ensuring products remain free from rancidity and musty odors while

adhering to statutory additive limits. Operating in parallel, MS 2027:2018 frames feeding through animal health, safety, and welfare. This standard explicitly bans unauthorized chemicals, additives, and medications, while requiring safe feed materials, pest-proof storage, detailed feeding logs, and adequate spacing for food and water consumption.

Furthermore, the Department of Veterinary Services (DVS) 2014 Guidelines for Good Manufacturing Practice (GMP) guidelines establish an extensive supply-chain quality model focused on risk mitigation from raw material sourcing and facility hygiene all the way through to transport logistics.

Field data shows that Company A synchronizes its operational workflows with both local rules and international standards. According to the breeder department manager, the enterprise uses structured diets to optimize feed efficiency and body weight uniformity by carefully managing nutrient ratios and lowering animal-origin feed components. Meeting these strict genetic targets requires careful control over weight sampling, mathematical modelling, equipment calibration, and microclimate regulation.

4.2.3 Animal Housing

In Malaysia, livestock housing sustainability is guided by MyGAP (2014) and MS 2027:2018 (GAHP), spanning housing management, layout design, biosecurity, sanitation, and environmental controls. MS 2027:2018 dictates that housing must provide adequate space based on flock age and size, ensuring unhindered access to feed and water. Furthermore, floors and pathways must be non-slip, safe, well-lit, and paired with clearance gates to prevent injuries. To manage local weather, Nazmi et al. (2015) note that 74% of Malaysian poultry farms utilize closed-house systems to integrate cooling, pest control, and waste management.

Internal corporate files confirm that these closed systems regulate air velocity, offset hot-season heat, control humidity, supply respiratory oxygen, and purge waste gases. Highlighting the need for temperature emulation, the General Manager of Company A's Breeder Division explained: *"As the chicken is not compatible with our weather, we need to imitate the temperature and origin environment to the poultry. Means that, we have to adjust the temperature accordingly like their origin temperature... we create origin surrounding for the chicks..."* Regarding site security, MyGAP guidelines mandate that production facilities maintain safe isolation buffers from residential areas.

Proper biosecurity demands appropriate isolation buffers to protect public tranquillity without breaching statutory frameworks. Confirming adherence to these guidelines, Company A's breeder division general manager stated that production sites maintain a minimum 2.5-kilometer buffer from housing developments, though field observations reveal actual travel distances reach up to 5 kilometres from nearby residential areas (Ng and Md Saleh, 2013).

4.2.4 Animal Transport

To safeguard animal welfare during transit, MS 2027:2018 requires specialized vehicles equipped with proper ventilation and spacing to shield poultry from pathogens and environmental strain. Transporters hold full legal accountability for the livestock's physical and psychological well-being throughout the journey. Regulations mandate that routes remain direct and unhindered, with long-distance movements requiring valid permits and veterinary clearances. While standard protocol restricts transport to healthy birds, compromised animals may be moved under strict precautions. Highlighting company scheduling routines, an administrative executive explained that transport lorries typically depart for plantations at night to arrive by early morning. Furthermore, decentralizing plantation sites across regions like Klang, Johor, and Penang helps minimize transit distances and reduce mortality rates from long hauls.

Regarding transport infrastructure, MS 2027:2018 dictates that logistics vehicles must facilitate easy loading and unloading while ensuring the physical safety of both handling personnel and livestock. The vehicle fleets must undergo strict cleaning and sanitization protocols, feature specialized flooring to provide secure footing, and incorporate functional drainage designs that allow for the isolated collection of animal urine. Field operations closely mirror these regulatory frameworks. The Quality Assistant Manager from the Processing Plant Division

at Company A noted: *"Our officers and workers inspect all incoming lorries during unloading operations to screen out unacceptable chickens, such as those that became sick or injured at our production plantations."*

Vehicle infrastructure must also facilitate easy loading, ensure worker safety, maintain sanitization, and feature secure flooring with urine-collection drainage. Processing plant quality officers screen all incoming lorries during unloading to filter out sick or injured birds. To mitigate thermal stress upon arrival, workers immediately transfer chickens to a shaded, fenced holding area and spray them with water before early-morning processing lines handle thousands of birds daily. To streamline delivery efficiency, hatchery procurement contracts explicitly require contract farmers to maintain independent transport assets.

4.2.5 The Poultry Slaughtering Process

Commercial poultry slaughtering workflows mirror standard animal processing protocols, though domestic operations focus predominantly on halal production. Baseline structural and sanitary requirements are regulated under MS 1500:2009 (covering halal food production, preparation, handling, and storage), which mandates strict facility designs, thorough cleaning routines, and total physical separation from non-halal animals to prevent cross-contamination across personnel and equipment. Statutory criteria further dictate that pre-slaughter handling must shield birds from unnecessary excitement, stress, or agitation, aligning with recommendations that poultry receive proper rest and feeding beforehand. During processing, operations follow MS 1500:2009 guidelines for slaughter, stunning, dressing, storage, and transport, requiring all stunning methods to hold explicit approval from the Malaysian Fatwa Council.

CONCLUSION

Analysing European Union frameworks shows that the EU has built comprehensive operational benchmarks for poultry production through targeted legislation focusing systematically on environmental protection, food safety, and animal welfare. Driven by the EU Farm to Fork Strategy (2020), the region has successfully institutionalized sustainable models across environmental, social, and economic pillars. To incorporate Green and Sustainability (G&S) criteria into Malaysia's halal poultry framework, data indicates operations are governed by five primary statutes: the Animals Act 1953, MyGAP (2014), the Animal Welfare Act 2015, MS 2027:2018 (GAHP), and MS 1500:2009. However, a major structural limitation is that most of these regulations apply generally to all livestock rather than offering poultry-specific provisions.

Consequently, Malaysia's shift toward sustainable poultry management moves at a moderate pace, supported by inter-agency collaboration among bodies like JAKIM, HDC, DOE, Standards Malaysia, MAFS, MATRADE, SIRIM, and the Ministry of Health. While drawing inspiration from the EU Farm to Fork framework can help transform the sector, findings confirm that no centralized, official documentation dedicated exclusively to G&S poultry practices currently exists. Furthermore, although MyGAP certification remains voluntary for commercial producers, it functions as a crucial benchmark for upgrading national production standards.

The European Union’s Farm to Fork (F2F) strategy cannot be directly transposed into the Malaysian context without substantial qualification. Differing market maturities, distinct regulatory frameworks, and tropical operating conditions mean that the EU model serves primarily as a comparative benchmark rather than a fixed operational blueprint for local halal poultry producers. Furthermore, embedding Green and Sustainability (G&S) criteria creates immediate hurdles regarding cost, implementation, and enforcement. Field interviews reveal that compliance demands heavy capital expenditure for closed-house modernizations and specialized waste management infrastructure. Compounded by fragmented enforcement across federal and state jurisdictions, these structural and financial realities complicate mandatory adoption for commercial operators.

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