

The Juxtaposition of Food Safety and Halal Regulations

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Abstract

Food safety is a requirement in the food industry for sustainable health and well-being of the public. Meanwhile, halal food assurance is crucial to address the halal food market segment. Currently, there are varying approach to these regulations around the globe. The objective of this review is to compare these two regulations and identify the variation that exists. This review uses a qualitative approach to study the available literature on the topic. The findings highlight the variation in regulations for both food safety and halal matter that vary from country to country. The motivation for the regulations in place is dependent on geographic, demographic, and socio-economic backgrounds. Attempts have taken place to harmonize these regulations but the reality of achieving uniformity is unrealistic. It is important to understand the similarities and differences of these regulations so improvements can be made for the benefit of food producers and consumers.

Keywords: Food Safety, Food Quality, Halal Assurance, Halal Food, Food Industry

INTRODUCTION

According to WHO (2022), food safety is a priority for public health and a sustainable life. Food safety issues such as foodborne illnesses, food contamination, and food adulteration are harmful and detrimental to the public. Therefore, food safety requires strict monitoring and implementation of available regulations. Food safety management is complex due to the involvement of many stakeholders including government agencies, food manufacturers, quality departments, and consumers. There is an emphasis on new problems in the food industry resulting from technology advancement, socio-economic changes, food innovation trends, and changes in consumer's preference (Santeramo et al. 2018). There is also an increase in awareness from consumers to have healthy and alternative food options which demands the quality and safe production, regulation control, and transparency in food production (Danezis et al. 2016)

Muslims adhere to diet regulations as outlined by the Quran and Hadiths (Ahmad et al. 2018). It is estimated that 70 % of Muslims worldwide follow these rulings as part of their faith (Rejeb et al. 2021). Correlation between religion and food is not new or exclusive to Islam and is observed in Judaism, and Hinduism too (Feeley-harnik 1995). Halal is an Arabic word meaning 'permissible'. An estimated 24% of the world's population are practicing Muslims and it is predicted that this will increase to 29% by 2050 (Kurniawati and Cakravastia 2023). The demand for halal food is inevitable to cater to the increasing number of Muslims worldwide.

Food safety regulation and halal management are country specific and despite having strict regulations, cases of malpractice still occur. This review aims to compare these two bodies of regulations to identify similarities and differences in its implementation and challenges.

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Food Safety Regulations in Different Countries

Countries across the globe adopts and execute food safety management differently. Relevant regulatory bodies can be established with variations where changes and improvements are continuously made to address current settings in the food industry.

In China the Ministry of Health has enforced food safety regulations since 1949. The production of safe food in China is influenced by internal and external factors in manufacturing (Guo, Bai, and Gong 2019). The external factor involves government regulations, encompassing the rules and guidelines governing the food industry. This acts as a deterrence from breaking the law and administrative rules. Internal factors are voluntary which is used to enhance market competitiveness. For example, third party food safety certifications provide food safety assurance which increases the market value of the product and instil customer confidence. Food safety incidents are still a common occurrence in China (Guo, Bai, and Gong 2019). This could be due to a disregard for social responsibility, low awareness on the importance of food safety, the intention to gain monetary benefits, and poor food technology.

Developed countries claims to have strong regulatory system for food safety. In the United States, the FDA regulations have shifted from correcting to preventing food safety cases from occurring (Grover, Chopra, and Mosher 2016). As of 2018, there are still programmes and requirements under review to improve their food safety system (Weinroth, Belk, and Belk 2018). Australia and New Zealand have established a collaborative approach to regulate their food safety (Weinroth, Belk, and Belk 2018). Since 1991, Food Standards for Australia and New Zealand was established as an authoritative body responsible for developing food standards. Australia and New Zealand both have strict regulations regarding the safety and biosecurity of foods and implements high precautionary measures.

In Malaysia, the Ministry of Health oversees the national food safety and quality control. Food manufacturers must follow the standards for preparation, handling, distribution, sale, and consumption safety of their product (Ahmad et al. 2018). Recurring cases of food fraud and adulteration serves as a pertinent example to why regulations are crucial (Musa et al. 2016). At the government level, the Bangladesh Food Safety Authority (BSFA) has the mission to protect lives and health by monitoring food safety. In addition to enforcement and regulation, Bangladesh has proactively undertaken measures to raise awareness about food safety. One such initiative is the establishment of the Bangladesh Society for Safe Food (BSSF) in 2017. The role of BSSF is to create accessible safe food and maintain a safe food supply chain to preserve the health of the nation. This shows Bangladesh's commitment in food safety where awareness on the subject is as important as regulations. In the Africa Agriculture Status Report 2020, Kang'ethe et al. (2020) highlighted that Africa faces the highest foodborne illnesses per capita compared to other countries. There are efforts to achieve food safety through authoritative bodies, but effective management is lacking (Kang'ethe et al. 2020). For example, Kenya has 23 different agencies responsible for food safety law but is not standardised. In Tanzania, food regulation is controlled by the Tanzania Bureau of Standards which works with other ministries and agencies. The Ugandan food safety control is placed under the Uganda National Bureau of Standards (UNBS) which develops and enforces regulatory standards.

Although these regulatory bodies exist, there are no consistent sets of standards and distinction of responsibility. It is apparent that the efforts to achieve food safety is at different stages across the globe. Some countries have established clear food safety management systems while other countries are at the development stage. The level of food safety in a country depends on various factors, including government authority, existing regulations, available resources and facilities, and the nation's awareness and willingness to support food safety measures.

Halal Regulation Comparison in Muslim and Non-Muslim Countries

The halal food and beverage market are expected to be worth USD 1063.11 billion by the year 2030 ("Halal Food And Beverage Market Growth & Trends" 2022). The global halal food market is worth 632 billion per annum and represents 16 percent of food consumption worldwide (Wilkins et al. 2019). Additionally, there is

growing demand from non-Muslim consumers who associate halal food acceptability with high quality and standards in line with food hygiene and safety (Rejeb et al. 2021).

In a Muslim majority country like Malaysia, it is inherent to have halal assurance system. Since 1972, halal related law was developed under the Trade Descriptions Act (TDA) to control and regulate halal products. Currently, the authority to carry out certification, audit, and monitoring of halal regulations falls under the Department of Islamic Development Malaysia (JAKIM) (Zakaria and Ismail 2014). Halal law in Malaysia is aligned with other food safety legislation such as the Food Act of 1983, the Consumer Protection Act of 1999, and the Animal Rules of 1962. Malaysia's halal assurance system is acknowledged at the international level as having global standards (Nik Muhammad, Isa, and Kifli 2009). A key component of halal food control that makes it different than laws and legislations put in place is the fatwa ruling. A fatwa is a legal ruling given by a recognized authority based on the Quran, Hadiths, and Islamic scholar's discourse. Through a fatwa ruling, current contemporary problems arising from new technology and ingredients can be solved (Ahmad et al. 2018).

Indonesia has a Muslim population of 88% and requires assurance on halal too. In 1989, halal awareness among the community grew and initiated halal regulatory activities (Ratanamaneichat and Rakkarn 2013). The Indonesian Council of Ulama (MUI) and the Assessment Institute for Foods, Drugs, and Cosmetics (LPPOM) is the governing body for halal food regulations. The LPPOM-MUI halal standards are inclusive of Livestock and Animal Health Act 1967, Health Act 1992, Food Act 1996, and Consumer Protection Act 1999. The Islamic state Brunei developed the Brunei Darussalam Standard Halal Food PBD24:2007 (Deuraseh 2019). Currently, based on the Halal Certificate and Halal Label (Amendment) Order 2017, business ranging from micro to medium enterprises have an obligation to be certified and use correct labelling and logo (Kifli 2023). Brunei recognizes that the halal industry is important to ensure high food quality and hygiene standard but it also serves as profitable revenue for the country (Kifli 2023). In contrast, Singapore's demographic is not dominated by Muslims. Nevertheless, Singapore has been managing its halal certification through the Majlis Ugama Islam Singapore since 1978. Singapore is aware of the importance of halal regulation considering the rising demand from local consumers and the growing halal tourism industry (Shirin Asa 2019). Similar to Malaysia, the halal certification is voluntary, and emphasis is put on cleanliness, hygiene, and management quality (Azam and Abdullah 2021).

Non-Muslim countries have also ventured into providing halal food to accommodate high volumes of Muslim tourists and the increasing halal market (Nuraini and Sucipto 2021). Countries like Japan formed a non-profit organization Japan Halal Association (JHA) that is responsible for the halal certification of food products and premises. Efforts taken by JHA have been recognized by the halal regulating bodies from Malaysia, Indonesia, Singapore, United Arab Emirates, and Saudi Arabia (Yamaguchi 2019). South Korea has also seen an increase in tourists from Muslim countries which led to the demand of Muslim-friendly options for food, facilities, and accommodations (Han et al. 2019). The Ministry of Agriculture Food and Rural Affairs introduced the halal food policy in June 2015 to focus on developing halal industry policies, export, and distribution network. The authority bodies responsible for halal certification and labelling are the Korean Muslim Federation (KMF) and the Korean Halal Association (KHA). The KMF has worked closely with the halal regulating bodies from Malaysia and Indonesia in their efforts to establish halal regulations (Han et al. 2019).

Fuseini et al. (2017) reviewed the concept of halal within the context of the European Union (EU). Halal food management in non-Muslim countries is challenging due to lack of understanding and limited knowledge of the concept (Fuseini et al. 2017). This is further complicated by the inconsistent regulation, absence of monitoring, and varying standards between authorities (Fuseini et al. 2017). Problems are hard to resolve using inconsistent standards and with little involvement from the government to inspect and provide authority, halal assurance and verification is difficult to achieve. A different perspective of halal regulation can be seen in Netherlands. The Muslim population accounted for only 6% of the population and the introduction of halal alternatives faced opposition from the locals (Havinga 2010). Claims of halal products relied on trust within the community. Challenges of halal food in the Netherlands include no regulation at the national level and resistance from animal rights organization (Havinga 2010). There is a negative connotation towards Muslim with growing Islamophobia, but freedom of religion permits halal business to still operate (Havinga 2010).

In the USA, there is a demand for freedom of choice in relation to food and transparency in labelling (Dahlan and Abdullah 2017). Individual states have had changes made in legislation to include halal law. For example, in New Jersey, the halal law requires that food businesses must inform consumers truthfully in matters of food production from raw material to the end-product (Regenstein, Chaudry, and Regenstein 2003). Other states that have adapted changes for halal regulations include Virginia, Texas, Michigan, Minnesota, Maryland, Illinois, and California. These states have varied jurisdiction and standards to protect their Muslim community's rights in obtaining halal food. In other states, there may not be explicit regulations or jurisdiction specifically dedicated to halal food. However, as awareness of halal practices increases, some states have chosen to incorporate halal concepts in their food products for marketing purposes (Dahlan & Abdullah 2017). Halal food is associated with quality, safety, and hygiene (Rejeb et al. 2021) and there is a necessity for halal regulation to accommodate Muslims even when they are a minority.

It is important to familiarize and understand the regulations around halal food for the benefit of consumers. The similarities between regulations of different countries lies in the basic principle of halal rulings where 1) the Quran and Hadith are sources to determine what is allowed and prohibited, 2) the implementation if halal is inclusive of cleanliness and good hygiene practices, and 3) it must be halal from the beginning to the end of the supply chain. The difference in implementation could result from understanding and awareness of the subject. The level of conviction in halal products are different because non-Muslims may prefer halal food for its high standards, but a Muslim is obligated to consume halal foods.

Challenges in the Food Industry Related to Food Safety and Halal Regulations

Despite regulations in place, the food industry is constantly faced with threats of adulteration, contamination, and fraud (Hassoun et al. 2022). Halal adulteration is a sensitive matter because it effects the beliefs of the Muslim community. In the past, products such as cold cut meats, marshmallow, canned beef have been investigated for pork adulteration (Kotecka-Majchrzak et al. 2021). Other vulnerable products are jellies, cakes, and candies, edible oils, and butter (Taylan et al. 2020; Prandi et al. 2017; Munir et al. 2019). For halal assurance, the entire supply chain is required to maintain the halal status of the food product (Kurniawati and Cakravastia 2023). This takes into consideration the raw materials, processing stage, and logistics of the product to avoid cross contamination with non-halal material (Zailani et al. 2017).

To overcome halal adulteration, detection of pork or lard in food products have been studied using various analytical methods (Berti, Yetti, and Asra 2020; Rohman and Windarsih 2020; Zia et al. 2020). For example, DNA detection analysis used next generation sequencing (NGS) (Akbar et al. 2021) and multiplex-polymerase chain reaction (PCR) (Zhao et al. 2021). Spectroscopy methods such as Fourier Transform Infrared (FTIR) spectroscopy (Candoğan, Altuntas, and İgci 2021), Raman spectroscopy (Logan et al. 2021), and Nuclear Magnetic Resonance (NMR) spectroscopy (Taylan et al. 2020) has emerged a popular analytical method used for detecting pork in food. Adulteration poses a significant issue in food safety and compromises the assurance of food quality. The implementation of Good Manufacturing Practice (GMP), Hazard and Critical Control Points (HACCP), and other quality control are all serious measures to avoid the occurrence of food safety issues. Together with legislation, education and training is also important for creating awareness on food safety (Cognard et al. 2021). Awareness is crucial at all levels within the food industry and beyond. For example, consumers' awareness particularly regarding labelling and the halal status of products can empower them to make informed choices.

Unfortunately, consumers lack access to advanced scientific measures that could confirm or refute the presence of adulterations in food products. Cases of adulteration are usually detected by investigations launched through suspicion or in some cases found by chance in academic investigations. In a halal study of street food in Thailand, 8.3% of samples of halal labelled products were positive for pork matter (Mohd Hafidz et al. 2020). However, in the case of street food, management of regulations are unclear. It is notable that Thailand is not a Muslim majority country so it could be possible that the target market is for non-Muslim consumption. Another illustrative example of the problem comes from a study conducted in Portugal (Amaral et al. 2017). The study found that out of the samples collected and analysed, 54% contained undeclared pork species in the product and surprisingly, 40% of these adulterated products had Halal certifications labelling (Amaral et al. 2017).

Food safety threats can also occur at all stages in the food supply chain and could be in the form of physical, chemical, and biological threats (Mahmoud 2019). Examples of physical threats are pieces of glass, metal fragments, or dirt. Chemical threats could be in the form of cleaning agents, pesticides, and food additives. As for biological hazards it could be because of bacteria, fungi, and parasites. Food safety incidents are recurring incidents in both developed and developing countries and could bring adverse side effects. According to the WHO (World Health Organization 2022), foodborne diseases can lead up to 600 million people falling ill every year worldwide. In a report, the World Bank in 2019 estimates the total cost of foodborne disease in developing countries to be up to \$110 billion annually (World Health Organization 2022). These figures indicate that food safety incidents not only affect global health but could also have an impact on the economy.

Food fraud directly affects consumers when the products received are compromised in content and quality. In addition to the food threats mentioned above, food safety incidents can also arise from food fraud. Food fraud encompasses food adulteration, food substitution, food mislabelling, unapproved addition, dilution, concealment, and grey market production. This could impair consumer trust in the product and in the standards imposed. Without proper labeling, declaration of ingredients, and transparency in product's detail, vulnerable consumers could have allergic reactions or harmful side-effects (Lubis et al. 2016; Ballin, Vogensen, and Karlsson 2009). Cases of adding melamine in infant formula (Johnson 2014) and lead in turmeric powder (Everstine, Spink, and Kennedy 2013) are some examples of harmful addition in food products. It is also unethical to misinform consumers of the products sold. Undeclared presence or contamination of food products is a sensitive matter related to health, faith, and life choices that food manufacturers must consider.

A study related to food safety have been conducted to identify the causes, the level of awareness and understanding, the practice throughout the whole supply chain and the type of incidents that occurred (Odeyemi et al. 2019). Odeyemi et al. (2019) conducted an international survey among consumers from Asia and Africa. These two regions are chosen because they have been identified to have high foodborne illness specifically due to poor food hygiene. Both regions have high number of developing countries that are densely populated, and the level of food safety knowledge varies across these regions. The study revealed that food safety issues in developing countries are more prevalent at the consumer stage. In Africa, citizens of Cameroon had the lowest food safety knowledge compared to Ghana and Nigeria. In Asia, the citizens of Iran exhibited the lowest level of food safety knowledge. Overall, Odeyemi et al. (2019) recommended that the enforcement of food safety standard procedures among food producers are not taken lightly. At the same time, food safety education should be a nationwide program.

Hoffmann, Moser, and Saak (2019) outlined factors that contributes to food safety problems in low and middle-income countries (LMIC) which include low consumer awareness and restricted financial capabilities. The regulatory authorities are often limited in resources and capacity to carry out strong enforcement. LMIC food market mainly consists as informal markets which makes regulatory control, food traceability, and food safety analysis difficult to monitor (Hoffmann, Moser, and Saak 2019). Efforts to increase food safety awareness through campaigns and implementing standards of safety food productions are expensive. In contrast, high-income countries have had the means to prioritize and invest in food safety control and regulations (Jaffee et al. 2019). Based on the review, it is evident that food safety is imperative but to obtain it requires commitment and expenses from consumer, producers, and the government.

In relation to food safety issues between 1998 and 2016 in South Korea where on average 51 cases per year were reported (Park, Kim, and Bahk 2017). The study identified the top five foods involved were fruits and vegetables, fish and fish products, meat and meat products, beverages, and confectionery. Food additives and pesticides found in food samples had the highest number of occurrences followed by foodborne pathogen, and physical hazard. As for the stages in the food supply chain, issues occurred mainly in the production stage followed by handling stage, and distribution stage (Park, Kim, and Bahk 2017). In majority of the cases, there were issues resulting from human error at the production and processing stage, but Park et al. (2017) concluded that in most cases this is caused by the lack of awareness on food safety regulations or negligence.

The challenges faced in implementing halal and food safety regulations are comparable. Any deviation that affects the halal and safety of the products could have serious repercussions. Awareness and a sense of responsibility is important among stakeholders from the authority, the producers, and consumers.

Challenges in Harmonizing Standards and Regulations

In producing halal and safe food products, both halal regulations and food safety regulations must be abided. There is considerable difference between the establishment of halal regulations and food safety regulations in terms of standardizations.

Based on the different reports on the establishment of food safety regulations around the world, each respective countries have specific methods of implementing necessary policies and procedures. Variation between countries can be seen in the delegation of responsibility such as determination of regulatory authorities and bodies. Generally, regulations include the basic food quality and safety standards that refers to the Good Agricultural Practice (GAP), Hazzard Analysis of Critical Control Points (HACCP), and International Organization of Standardizations (ISO). There are also private food safety and quality standards such as the Eurep-GAP, the British Retail Consortium (BRC), and Safe Quality Food (SQF). The Codex Alimentarius Commission also developed international standards to be used worldwide in efforts to harmonize food safety regulations (WHO 2019). WHO (2019) highlighted that harmonization creates an efficient framework that could help in surveillance, intervention, and prevention of foodborne risks. However, it is acknowledged that the implementation will be dependent on national policies that could be specific geographically and socio-economically.

A company with a recognized quality standards has the advantage of having consumers' confidence and a competitive value in the market. However, implementing food safety standards requires financial investments to obtain accreditations and certification (Trienekens and Zuurbier 2008). This poses as a challenge especially in developing countries where the lack of these standards could lead to a huge market gap with other countries. Although the agenda of harmonizing standards are with good intentions, there may be hindered by practicality and political feasibility as demonstrated by the authors in cases between ASEAN countries in trade practices (Devadason, Govindaraju, and Tuck Cheong 2016).

Efforts to harmonize available halal standards have been ongoing since 1984 by the Organization of Islamic Cooperation (OIC) (Abdallah, Rahem, and Pasqualone 2021). The World Halal Food Council was established in 1999 as an effort to outline a global halal standard. In 2006, another attempt was made by establishing the International Halal Integrity (IHI) Alliance to develop a global halal standard (Wan Hassan 2007). Another step was taken in 2016 with the formation of International Halal Accreditation Forum (IHAF) where halal accreditation bodies joined together which include Muslim and non-Muslim countries (Halim and Salleh 2012).

The challenges in creating a uniform halal standard include differences based on geographical ideology and the multiple standards available at national, regional, and international levels (Abdallah, Rahem, and Pasqualone 2021). This is apparent by the diverse ruling available on matters such as categories of animal prohibited, animal slaughter method, alcohol levels and definitions and much more. Reports have also shown that there are more differences than shared commonalities in halal regulations specific towards regulation requirements that focuses on quality standards instead of fatwa rulings (Azam and Abdullah 2021).

CONCLUSION

There is a parallel relationship between the food safety and halal regulation. Both regulations stem from a need to control and manage the food supply chain to provide safe, quality, and halal food. Both regulations are present worldwide but at different scale and stage of establishment. This difference could be due to the difference in socio-economic backgrounds of the countries where food safety implementation requires adequate resources, awareness, and support from different stakeholders. Despite the efforts taken by relevant bodies on halal assurance and food safety standards, there are still occurrence of these regulations being challenged. Halal adulteration of food is unacceptable, and cases of food fraud are harmful. There is a constant need to maintain the proper establishment of regulations that results in continuous discussion and discourse over the matter. Attempts to unify these regulations can be seen for both halal regulations and food safety

regulations. The aim of these regulations outlined are agreeable but the methods to achieve it varies. Again, variations based on geography, demographics, and socio-economic factor plays a role in determining the outcome of these efforts. It is not certain if one standard for each regulation is achievable but there must be continuous improvements to all regulations to align with new developments in the food industry that may include emerging technologies, ingredients, and processing methods.

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