Vol. 1, No. 1, 208-219
SALAM Digest

Submission date: 1 Nov 2022 *Acceptance date: 21 Dec 2022* *Publication date: 12 May 2023*

GENETICALLY MODIFIED FOOD: ANALYSIS FROM MAQASID SYARIAH VIEW AND REGULATORY FRAMEWORK IN MALAYSIA

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ABSTRACT

Genetically modified food (GMF) is one of the advances in biotechnology that has become a contentious issue with strong arguments on both sides. Proponents of GMF highlight its potential benefits, such as increased food production, improved nutritional value, and enhanced crop resistance, while opponents' express concerns about potential health and environmental risks, along with ethical and socioeconomic implications. Therefore, the Muslim community becomes doubtful whether it is allowed in Islam or not. A detailed qualitative approach based on library research was used to explore those issues, and all data were descriptively examined. Through this research, every genetically modified food product must meet the principles of maqasid syariah while also benefiting human life, health, and finance without neglecting the concept of halalan tayyiban (permitted and clean) and not harming people. It also addresses the Malaysian regulatory framework for ensuring GMF safety for Muslim consumers.

Keywords: *Biotechnology, food products, maqasid syariah, safety*

Cite as: Mohamad Kamal, S. N., & Ahmad, N. M. (2023). Genetically modified food: Analysis from maqasid Syariah view and regulatory framework in Malaysia. *SALAM Digest, 1*(1), 208-219. Retrieved from https://salam.usim.edu.my/index.php/salamdigest/article/view/71

Introduction

Genetically modified food (GMF) is food that has been genetically modified using recombinant DNA technology. This technology allows scientists to insert genes from one organism into another, in order to create new traits or improve existing ones. GMF is a controversial topic, with proponents arguing that it can help to improve food security, reduce pesticide use, and increase crop yields. Opponents of GMF, on the other hand, are concerned about the risks to human health, the environment, and the economy.

The widespread consumption of genetically modified foods has caused challenging issues in Malaysia, where the combination of modern biotechnology, Islamic ethical principles based on Maqasid Syariah, and regulatory frameworks creates a significant obstacle. Maqasid Syariah emphasizes objectives like life preservation and ethical behaviors, prompting a need to evaluate the compatibility of GM foods with these principles. Additionally, Malaysia's regulatory frameworks must balance economic, social, and ethical considerations while incorporating Maqasid Syariah values. The central problem involves assessing the alignment of GM foods with Maqasid Syariah objectives, exploring how Malaysia's regulations incorporate these values, and understanding the challenges of public engagement in these discussions. Addressing these concerns is essential to create a comprehensive approach to GM food regulation that respects Islamic ethics, promotes food security, and ensures public trust.

This paper will analyse GMF from a Maqasid Syariah perspective and examine the regulatory framework for GMF in Malaysia. It will argue that GMF is permissible from a Maqasid Shariah perspective, provided that it is halal and *thoyyiban* (good), produces a net benefit to society, and is produced and distributed in a just and equitable manner. The paper will also argue that the Malaysian regulatory framework for GMF is generally consistent with these principles, but that there is room for improvement.

Methodology

In this research, a qualitative approach will be conducted to gain an in-depth understanding of the issues and concerns related to genetically modified foods. This qualitative study analyses journals, authentic websites, articles authored by academics and scholars using library research methodology or documentary analysis. Researchers read and analyse the content to identify relevant themes, arguments, and perspectives related to the halal issue and safety considerations of cultured meat. Next, researchers will identify key points related to production, religious perspectives, and guidelines for cultured meat. Then, critically evaluate the sources and analyse the findings and interpretations presented in the literature. Next, summarize the main findings, highlight any key considerations, and make recommendations for future research, policy development, or industry practices. This method offers the opportunity to analyse existing literature, and policy frameworks to inform future decision-making and research directions.

Results and Discussion

The population increases every day, which raises the demand for food. Due to the limited amount of agricultural land available for food production, higher costs of labour, and the impacts of climate change, the situation becomes more critical. Consequently, adopting current biotechnology to increase food supply through genetic modification (GM) is one of the ways to address this issue. Genetically modified food (GMF) is created when genes are isolated from one creature and transferred to another, improving both the quality and quantity of agricultural output or food. However, the safety of consuming the GMF product is currently a worry for many parties. Does it have any negative effects on safety, the environment, health, or religion? Therefore, from the perspective of Islam, which we believe, we must return the favour. The continuation of this investigation on GMF will reveal the findings, whether they are positive or negative.

Genetically Modified Food (GMF): Overview and Controversy

Genetically modified organisms (GMOs) are organisms that were created with their genetic material altered in a way that does not occur naturally. The terms "modern biotechnology" or "gene technology," as well as "recombinant DNA technology" or "genetic engineering," are commonly used. It enables the

transfer of certain genes from one organism to another, as well as between species that are not related. Genetically Modified foods (GMFs) are frequently referred to as foods created with or using Genetically Modified organisms (GMO) (WHO, 2016). A genetically modified food is one that has been created using a genetically modified organism (GMO) or living thing. A GMO is a genetically modified animal, plant, or microorganism. Scientists rely on genetic engineering, also known as modern biotechnology, gene technology, or recombinant DNA technology, to genetically modify an animal, plant, or microorganism. To summarize, GMFs are all GMOs, but not all GMOs are GMFs. GMO refers to the organism as a whole, whereas GMF refers to the food product produced by it. In the process of creating GM plants, new DNA is delivered into plant cells. These cells will subsequently be put in tissue culture, where they will grow into plants. The modified DNA will be transmitted down to the seeds produced by these plants.

Oliver argues that the definition of GMO is imperfect because it includes Triticale, a grain that was developed using conventional selective breeding methods but later modified using the chemical colchicine to make it fertile. He suggests that a more accurate definition of GMO would be "biotechnologically modified organism"(Oliver, 2014). In other words, Oliver is saying that the current definition of GMO is too broad because it includes organisms that have been modified using non-biotechnological methods. He suggests that the definition should be narrowed to only include organisms that have been modified using biotechnology, such as genetic engineering (Oliver, 2014).

Between the years 2012-2014, an estimated total of 805 million people from developing countries experienced poverty, hunger, and lack of nutritious food supply (FAO 2014). In addition, problems related to urbanization, changes in daily routine and diet, as well as unexpected changes in the global climate, are the major obstacles in the area of food security. Due to the imbalance between the pace of food production and the rate of demand, this condition makes the problem of food security more serious.

Agriculture biotechnology is crucial for reducing hunger and promoting growth and development in a way that is both ethically acceptable and environmentally sustainable. This is due to the prediction that the world's population will double in 50 years, reaching more than 8.9 billion people. When higher demands for food will arise due to population growth and improved diets. The quantity of land currently used for food production cannot, in some way, meet the rising demand for food.

GM technology is one of the modern agricultural biotechnology alternatives that has the potential to contribute a significant impact in dealing with food security issues. The result of DNA manipulation through GM technology allows scientists to select quality traits or remove unnecessary traits to develop new varieties of the best plants with the desired traits through direct gene transfer from the same organism or other organisms (Umi Kalsom, 2019).

GMF crops are engineered to have specific characteristics, such as resistance to pests and diseases, improved nutritional value, or increased tolerance to herbicides. GMF has the potential to revolutionize agriculture and help us address some of the world's most pressing food and nutrition challenges. For example, GMF crops can be engineered to produce higher yields, which can help meet the growing global demand for food.

In addition, GMF crops can be engineered to be resistant to pests and diseases, which can reduce farmers' need to use pesticides and herbicides. This can benefit the environment and can also save farmers money. Next, GMF crops can be engineered to have better nutritional value. For example, golden rice is a GM crop that has been engineered to produce beta-carotene, which is converted to vitamin A in the body. This can help reduce the incidence of vitamin A deficiency, which is a major health problem in developing countries. In addition, GMF crops can be engineered to be more resistant to drought, salinity and other stresses associated with climate change. This can help ensure that farmers can continue to produce food in the face of climate change. Clearly the goal of GMF is to change the genetic code of plants and animals to increase their productivity or make them more resistant to pests or agricultural practices, such as dousing them in chemicals that would normally kill them. For example, genetically modified soybeans can resist herbicide sprays that would kill organic soybean plants. It is rather worrying to consider that the commercialization of biopharmaceuticals, followed by the commercialization of genetically modified crops, is the main focus of current biotechnology products (Mohammad Hashim Kamali, 2018).

There are many GMO products that benefit humans. This includes transgenic plants, animals, and microorganisms. For example, transgenic plants are engineered to have better characteristics such as higher yields, better quality and resistance to biotic and abiotic stresses. For example, Bt cotton is a transgenic plant that produces a toxin from the bacterium Bacillus thuringiensis, which kills the bollworm.

In addition, transgenic animals are modified to produce useful substances, such as recombinant proteins, vaccines and antibodies. For example, Dolly the sheep was the first mammal to be cloned from adult cells, and she was used to produce human proteins in her milk. Another example is GloFish, which is a transgenic zebrafish that has a fluorescent gene from a jellyfish or coral and can be used as a biosensor for environmental pollutants.

Next, transgenic microorganisms are manipulated to increase their metabolic capabilities, such as producing enzymes, hormones, and antibiotics. For example, Escherichia coli is a common bacterium that can be engineered to produce insulin, a hormone that regulates blood sugar levels in humans. Another example is Saccharomyces cerevisiae, a yeast that can be modified to produce ethanol, a biofuel that can reduce greenhouse gas emissions (Tanu Rapria, 2023).

Despite several benefits to humans and the environment, genetically modified food technology is not without controversy and harsh criticism. Many argue that this technology was created by greedy scientists and conglomerates. At the same time, GMF technology has great dangers to human health and the environment. (Clark, 2013; Ghana Public Health Association, 2014).

According to Arpad Pusztai, a scientist in the field of biochemistry, GMF can leave a negative impact on human health due to the influence of foreign DNA that has been mixed in GMF products. This argument was further strengthened when he made a detailed study of 40 laboratory rats. The mice were fed the first transgenic tomato product produced by *Calgane* called *Flavr Savr*. The study found that seven of the 40 mice had died of unknown causes. He argues that if most countries accept biotechnology, it will endanger our lives on Earth (American Institute of Biological Science, 2005).

In addition, Arpad Pusztai has several times conducted similar studies on laboratory mice but this time he fed the mice with transgenic potatoes. As a result, most mice suffer from serious health problems such as immune system damage, smaller kidneys, and stunted growth. Therefore, this study has raised objections from various quarters, including among British politicians and scientists. In addition, the study also raised objections from the independent science academy based in the United Kingdom known as The Royal Society. The Academy claims that the study conducted by Arpad Pusztai was disorganized and disorganized, besides having many weaknesses in many aspects of science (The Royal Society, 1999).

Therefore, it is illustrated that there is an incomplete disagreement to this day among western scientists (Yaakup Che Man, 2011). Furthermore, scholars also argue about the determination of legal opinion in food products obtained through modern biotechnology. Therefore, the issue of GMF is difficult to determine (Tamyes Abd Wahid 2011). Through research, scientists have concluded that genetically modified foods have deficiencies that can bring harm to humans and the environment.

According to Edwin Chargoff, the father of molecular biology, genetic modification in food is the largest and most dangerous experiment in human history. He also stated that the modification of food technology as a greater threat than nuclear technology. The American Medical Association has also issued a similar statement regarding the possibility of the GMF process being able to cause environmental damage. Among the reported concerns are possible virus-resistant crops produced by GM and GE (genetic engineering). The virus may change into a new form that is more dangerous and can attack other plants and animals (Izhar Arif, Ahmad Husni, 2017).

There are some people who say that GMO products affect the environment such as loss of biodiversity and environmental pollution. Large-scale GMO production can lead to increased use of herbicides and pesticides, harming biodiversity and disrupting ecosystems. Additionally, reliance on some types of GM crops can reduce genetic diversity in the food system. Additionally, GM crops have the potential to cross-pollinate with wild relatives, introducing their modified genes into natural populations and potentially harming native species. In addition, ethical concerns also arise when some argue that

modifying organisms is playing God and disrupting the natural order. This raises questions about the ethical boundaries of human intervention in nature. Furthermore, some GMFs are produced using animal testing, raising concerns about animal welfare and the ethical implications of using animals for scientific research.

However, the FDA and the World Health Organization say GM foods on the market are as safe and healthy as non-genetically modified foods. The National Academy of Sciences, Engineering and Medicine says there is no health risk if you eat food made with GMOs (Neha Pathak, MD, 2022). Researchers in China addressed concerns about unstable GMO DNA affecting consumers through mutations. They discovered no elevated mutation rates in mice or humans that consumed GMO tomatoes and corn using a common test for mutation-causing chemicals. Concerns regarding DNA transfer or toxicity were further clarified by studies demonstrating that GMO DNA is chemically identical with normal DNA in terms of chemical makeup, digestibility, and allergenicity. Attempts to discover transmitted GMO genes in rats fed GMO potatoes for generations were unsuccessful, adding to the evidence that GMOs are safe for human consumption. In summary, the research demonstrates that GMOs are not mutagenic or dangerous, and that their DNA behaves in the body similarly to natural food DNA (Megan L. Norris, 2015).

However, issues of biotechnology use and its ethics are quite complicated questions that are not so straightforward. A few Muslim jurists hold the view that these techniques should be allowed if in any way they aim to protect people or enhance agriculture production. Some of these worries include concerns about safety, and why these technologies should not be implemented. As for the cloning of microbes, plant or animal subject to relevant principles of shariah it might be allowed in order to prevent a manifest harmful (*darar*) even fatal disease which could have no cure. This type of cloning could also be permissible towards the benefit of mankind, environmental protection and health improvement, to make use e.g., useful protein and hormone to beat suffering from starvation and emaciation.

Jurists, and commentaries continue debating on various issues regarding GMOs and genetically modified crops because clear and definite Muslim answers in this regard are rather scant. As such, different opinions have developed leading to varying scholarly views. Some Islamic scholars consider the use of GMOS in terms of *Maslahah* (greater good), which is to ensure adequate foodstuff for ever increasing community by rendering it less vulnerable against diseases, bugs and environmentally inflicted damages. Opponents of GM suggest that there are several threats linked with this technology such as environmental hazards and adverse health effects among the populations. Both sides have provided arguments based on their interpretations of Shariah's higher objectives (maqasid) of protecting life and the natural environment, as well as encouraging family and generational well-being. Both parties have pointed out the importance of maqasid-related environmental elements of GMOs in agriculture and animal husbandry (Mohammad Hashim Kamali, 2018).

So, the debate over GMF is likely to continue for many years to come. As technology continues to develop, it is important to weigh the potential benefits and risks carefully. It is also important to ensure that GMF is used in a responsible and sustainable manner.

Maqasid Syariah Review On GMF

GMF requirements are very important to meet today's problems. Even so, these contemporary food products are required to comply with the principles of Maqasid Syariah for the Muslim community to consume. This maqasid syariah is important to maintain the values of goodness and avoid badness or harm that will happen in human life (Mohd Fadzli, Wan Harun, Baharuddin, & Reza Adnan, 2021).

In this context, for a society that is facing the problem of starvation, then this GMF is a necessity that is daruriyyah to ensure that the highest Shariah goal can be achieved, which is to preserve life. However, for a society that already has enough economy, this GMF is one of the lowest options. So, at this stage, they should look at the halal and safety status of the food (Adenan, et. al., 2023).

The purpose of maqasid syariah is to uphold human benefits (*maslahah*) on earth, particularly in preserving human life and well-being. Islam allows halal and wholesome foods while prohibiting harmful, dangerous, or impure substances in food. The exceptions to this prohibition are emergency situations where human lives are at risk. In such cases, Islamic jurists permit the use of normally unlawful substances for food production under specific conditions, prioritizing the preservation of life.

Islamic law aims to safeguard human life and welfare, including in food production through modern biotechnology, in line with the principles of maqasid syariah. Although the Quran and Sunnah do not specifically address modern biotechnology, general principles are applied. Fiqh, ijtihad, maqasid syariah, and other legal instruments are used to determine the legal status of modern biotechnology products, especially in contemporary issues where specific guidance is lacking.

Maqasid is a goal that must be fulfilled when doing something. In this context, maqasid is defined as goals and objectives laid down by law. Various definitions of the term maqasid have been given by jurists (Mohd, Ezad Azraai Jamsari, et. al., 2018). According to Ibn Manzur (2005), the term maqasid syariah itself consists of two words derived from the Arabic words maqsad and sharia. The word maqasid is the plural of maqasd which means target, cause, justice and holding. While according to al-Razi (1997), sharia in terms of language comes from the Arabic word shara'a which means an unbroken source of water. Al-Jurjani (2004) said it means continuous and always flowing. On the other hand, Ibn Manzur (2005), on the other hand, shara'a means to give way. In addition, according to al-Yubi (1998), sharia from a term point of view is interpreted as a rule that has been established by Allah Ta'ala for humans through his prophet.

According to Ibn 'Ashur (1978), Maqasid sharia as a whole can be defined as: "the meaning and secret that can be understood from Islamic sharia in the whole or a large part of the process of sharia". Al-Yubi (1998) also defines the meaning of maqasid syariah which is: "Meaning, wisdom and the like that are taken into account by sharia in general or specifically with the aim of providing good to people". Al-Fasi (1993) also stated the meaning of maqasid syariah as: "The purpose of shari'ah and the secret placed by syariah on each of its laws" (Mohd Fadzli, Wan Harun, Baharuddin, & Reza Adnan, 2021).

Islamic scholars consider the application of Maqasid Shariah to modern biotechnology products. Maqasid, including *Maslahah* (benefit) and *Mafsadah* (harm), are relevant in evaluating these products. Maslahah is defined as benefit or the avoidance of harm. It encompasses various meanings, such as pleasure, delight, and ensuring the completeness of human life. Several scholars believe that the term "*masalih*" or "*maslahah*" (interest) is often associated with the concept of "*mursalah*" (unrestricted public interest), as neither of these terms is explicitly mentioned in the Quran or the Sunnah, as stated by scholars such as Zaidan (1998) and Zuhaili (1998).

Scholars agree that *Maslahah* must align with Islamic law, focusing on preserving religion, life, intellect, lineage, and property. *Mafsadah*, on the other hand, represents harm to these aspects. Not all *Maslahah* can be used in formulating legal rules because they are adopted and also rejected *maslahah*. According to al-Tabarani (1983) there are three types of *maslahah*: 1. *Maslahat al-mu'tabarah* which is accepted by Islamic law (supported by Quran and Sunnah), 2. *Maslahat al-mulghah* which is rejected by Islam (contrary to ijma and qiyas), and 3. *Maslahat al-mursalah* which is indeterminate (intended by legislation but lacks specific arguments). Maqasid adopted by Shariah scholars have clear values and evidence from Quran and Sunnah. *Maslahah mursalah* as mentioned above refers to any interest, which is not mentioned in the Qur'an or Hadith. These interests are regarded as *mursal* since they have not been addressed textually. This is the principle that may be adapted to justify the necessity of changing God's creation in GM technology and claiming legal ownership over such foods and products.

Some scholars define the principle as "public welfare." According to Mahmassani (2000) these principles, along with other principles like "*istishab*" and "*istihsan*," stems from reasoning, focusing on understanding the underlying reasons behind rules, fulfilling people's interests in their social lives, and aligning with the principles of goodness, justice, and equity. However, this reasoning can apply to transaction matters but not religious observances (*ta'abudiyyah*). Actions benefiting people are generally considered legal and lawful, and many Muslim jurists agree that the benefit or harm resulting from an action is the governing measure for its legality.

The Maliki School of law advocates this principle, emphasizing the benefit or harm criterion. However, scholars from the Shafi'i School of law often reject "*masalih mursalah*" as a source in Islamic legal rules due to variations in interests based on people, time, and place. They are concerned that as "*maslahah*" or interest is subjective, it could be exploited to justify unlawful desires. Generally, Shafi'i scholars reject "*maslahah*" as a determining factor in legal rulings. Nonetheless, Ghazali in his book "*al-Mustasfa*," as cited by Zuhaili (1998), sanctions its application only when serving an absolutely essential "*maslahah*" and establishes strict guidelines for using this principle to derive legal rulings in Islam. (Yasmin Hanani,2019)

The approach to the concept of maqasid shariah aims to protect the benefits of human life in terms of the five main principles in the concept, which are to preserve religion (*hifz ad-din), preserve life (hifz an-nafs*), preserve reason (*hifz al-aql*), taking care of offspring (*hifz an-nasl*) and preserve property (*hifz al-mal*). As a Muslim community, we must always examine every food we choose must be halal, clean and safe to eat. This aims to avoid any confusion about the food chosen whether it is in accordance with the Islamic law that has been established by Allah S.W.T. or vice versa (Mohd Fadzli, Wan Harun, Baharuddin, & Reza Adnan, 2021).

According to Malabika & Mohammad (2014), genetic technology can and should be used positively to preserve endangered species. Stakeholders agree to use the term environmental protection as a refinement to the concept of Maqasidal-Shariah (*hifz-maal*). Further, the purity of future generations in terms of their physical, spiritual, mental, and genetic composition must be protected. It must be remembered that the current generation does not inherit but borrows the Earth from future generations. This is as emphasized in the essence of principle number four of Maqasid al-Shari'a which is the preservation of offspring (*hifz an-nasl*).The emphasis on protecting human intellect, *hifz al-aql*, established by Maqasid al-Shariah, is critical in evaluating GMO products. GMOs must prioritize safety, transparency, environmental responsibility, social justice, and knowledge sharing in order to uphold this principle. This includes conducting thorough safety assessments, informing consumers, reducing environmental damage, promoting fair distribution, and encouraging open scientific discussion. Finally, *hifz al-aql* directs appropriate GMO development and use, ensuring human well-being in all aspects. In discussing the principle of religious preservation, the source of GMF products must be from a halal source. The allowed concept is known as *halalan toyibban* in Islam where mankind must only use products that are clean, beneficial and safe (Quran 1; 168). Therefore, the panel agreed that this principle can be applied and is important in ensuring that consumers in Malaysia are able to choose GM products that preserve the purity of their respective religions. In fact, this can be solved with transparent labelling of the sources used in GM products. GMF products must not harm human health or life, according to the principle of life preservation. Allergies and gene mutations must not exist; otherwise, the demands of this principle are violated (Asmadayana Hasim et al., 2021).

Maqasid shariah has been divided into three maslahahs, namely necessity (*dharuriyyat*), desire (*hajiyyat*) and perfection (*tahsiniyyat*) (al-Ghazali, 1901: Azizan Ramli et al., 2016; Baharuddin et al., 2020). In summary, according to al-Ghazali (1901), he stated that *maslahah dharuriyyat* is the main requirement to preserve the five things, namely religion, life, intellect, lineage and wealth. If one of these needs is not met, then human life will experience difficulties. In the context of genetically modified food (GMF), if the food product is produced from animal or plant sources that are not halal but has to be used to continue human life, then the use of the food product is allowed according to the requirements of *dharuriyyat* based on syariah law (Mohd Izhar Ariff & Ahmad, 2017)

In addition, the necessity of *hajiyyat* is also another *maslahah* that eases human life and saves it from difficulties and obstacles within the community (al-Ghazali, 2007). Human life will go on although in the absence of this need the absence of *dharuriyyat* will not have any effect on human life (al-Shatibi, 1999). But one ought to avoid problems in communal life as well. For instance, golden rice, a genetically modified rice that is designed to enhance Vitamin A content in rice can be cited as an example of *maslahah hajiyyat*. This is so due to the fact that the genetic modification of rice plants aims at improving the health of the people and reducing the hardships in human life. Next, *tahsiniyyat* are things that lead to the perfection of human life such as manners, dignity, behaviour, ethics, and morality (al-Ghazali, 1901: al-Shatibi, 1999). Al-Ghazali observed that if this *maslahah* was not adhered to, then the life of honour and glory would be lost (al-Ghazali, 1901). Regarding this, al-Shatibi (1999)

mentioned that anything that prevents people from consuming harmful food is likewise included in the category of *maslahah tahsiniyyat*. Including eating GMF that fully complies with the concept of *toyyiban halal* that does not harm to human security and health in this *maslahah*. Therefore, genetically modified food (GMF) can also be assessed based on three *maslashaat* categorized under maqasid syariah namely *dharuriyyat*, *hajiyyat* and *tahsiniyyat*. The main *maslahah* category is dharuriyyat, through which this food product could be evaluated after being assessed according to the hajiyyat and *tahsiniyyat* categories (Noor Munirah, 2014). Therefore, it can be concluded that GMF food is a *maslahah dharuriyyat* when consuming GMF food obtained from non halal or doubtful sources for the continuation of one's existence. Meanwhile, GMF food that follows to the principle of *halalan toyyiban* can be classified together *maslahah hajiyyat* and *tahsiniyyat* based on maqasid sharia assessment (Mohd Fadzli, Wan Harun, Baharuddin, & Reza Adnan, 2021).

Islamic law aims to safeguard human life and welfare, including in food production through modern biotechnology, in line with the principles of maqasid syariah. Although the Quran and Sunnah do not specifically address modern biotechnology, general principles are applied. Fiqh, ijtihad, maqasid syariah, and other legal instruments are used to determine the legal status of modern biotechnology products, especially in contemporary issues where specific guidance is lacking.

The legality of modern biotechnology products like GMF are not necessarily based only on maqasid syariah but rather meet criteria rooted in the Quran and Sunnah. It involves the *halalan tayyiban* principle which determines the permissibility of GM foods, implying that if the original genes are from halal source, then the product is halal otherwise it is haram. It benefits and it should be consistent with the *halalan tayyiban* principle in order to make the Maqasid Shari'ah of human life. In any sense, a product of modern biotechnology that poses danger to a man, is haram and therefore should be refused, for *maslahah* comes first. (Mohd, Azraai Jamsari et al., 2018).

Clearly, *Maslahah* should be applied to produce halal foods such as GM products without contravening the teachings of Al Quran, As Sunnah, consensus and analogical rationale. Furthermore, it should have no major impact on the main goals of shariah like life, intellect, and other important elements for human well-being, which are crucial factors for general comfort. If the original gene used in the GMF product is from a haram source, then it is haram for Muslims to consume it.

Regulatory Framework of GMF In Malaysia

According to Latifah et al., (2014), Fatwas decided by law-making bodies (i.e. ijmak ulama) such as the Department of Development Malaysian Islam (JAKIM 1999), Islamic Fiqh Academy (2000) and Majlis Ulama Indonesia (Amru Hydari Nazif 2011) states that the majority of Islamic scholars agree GMF products provided they comply with certain criteria and established guidelines. Three (3) criteria which need to be followed are 1) GMF products are produced from halal sources, 2) GMF production process must be free of illegal elements, and 3) GMF products do not bring harm to consumers and the environment around. However, the concept of legal succession also stipulates that GMF products can only be produced if it provides a clear benefit to the user as well as urgent needs such as shortages serious food supply (Norkhazzaina et al., 2014).

The 95th Fatwa Committee's decision affirms the importance of selecting food that is halal, pure, and not harmful to human well-being or the environment, in accordance with Islamic principles. It prohibits the use of prohibited and harmful substances in GM Food production while permitting the use of halal farm animals if slaughtered in accordance with Islamic law. This decision reflects the committee's consideration of the ethical and health aspects of GM Food within the framework of Islamic jurisprudence (JAKIM, 2011).

GM foods in Malaysia are subject to the Malaysian Biosafety Act, specifically for food, feed, and processing (FFP) purposes. Stringent policies are applied to prevent accidental spillage or unintended release of GMOs into the environment. Malaysia's National Agricultural Policy encourages consumption technologies including GM technologies that can help farmers produce more sustainable food in conditions of dwindling resources. In Malaysia, the process of production, cultivation, use and introduction of GM based organisms and plants whether domestically or abroad is strictly controlled by

Malaysian laws under the Biosafety Act (2007) and the Biosafety Regulations (2010) (Rahman, n.d., 2019).

This act regulates the importation, export, production, release, and use of genetically modified organisms (GMOs) and their products in Malaysia. The act is enforced by the National Biosafety Board, which is responsible for assessing the safety of GMOs and their products before they are approved for commercialization or release into the environment. These include the Plant Quarantine Act 1976 and the New Plant Protection Act 2004. This Act was enacted to control activities involving agriculture such as the release of new breeds following the genetic modification process as well as the trade (import) of plants from foreign countries (Hatijah, 2019).

The Biosafety Act was published in the Gazette on August 29, 2007, and came into force on December 1, 2009. This Act is divided into seven parts consisting of I) Preliminary, II) National Biosafety Board, III) Approval for release and import, IV) Notification for export, contained use and import for contained use, V) Risk assessment and risk management reports and Emergency response plan, VI) Enforcement, VII) Miscellaneous. Furthermore, this Act contains 71 sections that cover various aspects of biosecurity in Malaysia, and it was enacted to regulate the release, importation, exportation, and controlled use of living modified organisms for the purposes of protecting human health, plants and animals, the environment, and biological diversity. Furthermore, with the widespread usage of genetically modified foods in a country, biosafety laws restrict it.

The Biosafety Act of 2009 regulates the labelling of all genetically modified organisms (GMOs) and their products to enable customers to make more aware food choices. The act also requires that GMOs be kept separate from non-GMOs, to prevent cross-contamination as contained in section 61 of Biosafety Act 2007, identification labelling.

In addition to the Biosafety Act 2009, Malaysia also has a number of other regulations that relate to GM food products. For example, the Food Act 1983 requires that all food products be safe and wholesome for human consumption. The act also requires that food products be labeled accurately, so that consumers know what they are buying.

Furthermore, the Ministry of Health has introduced new regulations in the Food Regulations 1985 to ensure food safety. This is supported by the Malaysian Department of Chemistry in identifying foods that contain GMO products. The regulatory framework regarding GMOs covers aspects of pre-market approval, enforcement, and post-market monitoring. The Food Regulation 1985 amended 2010 (Ministry of Health) is to enforce the labelling of GMOs. The labelling requirement only involves the three main ingredients in the list of ingredients. For GMOs that have genes from animals and ingredients that are known to cause allergic reactions, the label must note where the genes are obtained from, such as genes obtained from the source.

However, the Protocol on Biosafety includes a provision, Article 26, addressing socio-economic considerations in the application of GMOs, but remains silent on bioethical concerns. While the explanatory text suggests that the value of biological diversity to indigenous communities could be part of socio-economic considerations, the protocol lacks clarity on the inclusion of bioethical issues. In Malaysia, despite provisions in the 2007 Act and 2010 Regulations regarding socio-economic considerations and ethics, the legal framework is vague on the protection of bioethical issues. Section 35 and regulation 25(b) mention socio-economic considerations, including ethics, but lack explicit definitions and clarity. The Biosafety Regulations state that ethical issues are part of socio-economic considerations, but the discretionary use of "may" raises uncertainty about the extent to which such considerations will influence decision-making. The current process primarily relies on scientific assessments, neglecting ethical considerations, leading to inconsistencies with the law's protectionist objectives. It is recommended that ethical considerations be prioritized over scientific evidence in decision-making, with both aspects assessed collectively in applications related to GM technology. Despite recent enforcement, these issues remain unresolved in Malaysia's biosafety framework (Idris et al., 2012).

In order to guarantee the purity and halal of the food that will be touched by Muslims, the products involved must also meet the established Halal standards. According to the Malaysian Standard (MS 1500: 2019), food and drinks containing products and/or by-products of genetically modified organisms (GMOs) or ingredients made using animal genetic material that are not Halal according to Sharia law are not Halal. Although there are guidelines regarding the supervision of "halal" GMOs, the implementation is still vague in ensuring that the product is safe and Halal. Until now there is still no comprehensive law and policy on GMOs that comply with sharia law (Hatijah, 2019).

Amendments to the Food Regulations under the Food Act 1983 were enacted in Malaysia to enforce the labelling of GMO products and foods. This regulation, effective from July 2014, provides consumers with information about GM foods and related substances in food products. However, products with GMO content less than 3% of the food ingredients are exempt from this labelling requirement. According to Malaysia Standard (MS 1500:2019), 4.7 packaging and labelling, materials and equipment used must be free of anything considered impure (*najs*) in Islamic law. Other than that, halal food must be physically separated from non-halal food and other impurities throughout the process. Packaging materials should not harm the food or pose any health risks, and the packaging design, labels, and images must be accurate and not mislead consumers about the food's halal status. In short, halal food packaging should be both physically clean and ethically transparent, ensuring consumers can make informed choices based on their dietary principles.

To make it easier for the public to choose halal GMO food, it is necessary to see the halal logo on every product because the logo indicates that the competent halal authority has certified the product or service to comply with MS 1500:2019 standards. The halal certification mark is a voluntary mark that can help consumers identify halal products and services and enhance the credibility and marketability of halal businesses. The halal competent authority in Malaysia is the Department of Islamic Development Malaysia (JAKIM), which issues halal certificates and halal logos to qualified applicants. JAKIM also recognizes halal certificates and logos from other countries that have mutual recognition arrangements with JAKIM (MS 1500:2019).

In summary, Malaysia has established comprehensive regulatory mechanisms and committees to oversee GMOs and GM crops, focusing on biosafety, environmental protection, and consumer information through food labelling. Research is closely monitored, and commercial use of GM crops is limited, with stringent controls in place (Sharmithaa Sanmugam et al., 2021). However, the government needs to strengthen the Act's bioethics framework and increase public participation in biosafety decisions as it is important to ensure a balanced approach that protects both the environment and human and animal health, while encouraging the responsible development of biotechnology. Malaysia's Biosafety Act requires an ethical upgrade. Vague bioethics and quiet publics will not protect us from the harmful effects of genetically modified organisms. It's time for clear guidelines and open doors.

Conclusion

Genetically modified foods (GMFs) are a complex issue with both potential benefits and risks. A holistic approach is needed to evaluate GMFs, considering Islamic principles, legal frameworks, scientific rigor, and public engagement. This will help ensure that GMFs are developed and used responsibly and ethically, maximizing their benefits while minimizing risks. A holistic approach that considers the principles of Maqasid syariah is essential for evaluating GMFs. Maqasid shariah, or the objectives of Islamic law, emphasize the preservation of the five fundamental necessities of human life: religion, life, intellect, lineage, and property. By assessing GMFs against these principles, we can determine whether they align with Islamic values and contribute to the overall well-being of society and the environment.

To address the complex and controversial issue of genetically modified food (GMF) in Malaysia, a comprehensive approach involving regulatory strengthening, public engagement, ethical prioritization, responsible research, and international collaboration is essential. for example, enhance existing frameworks with a dedicated agency and stricter labelling. other than that, conduct awareness campaigns, encourage participation, and foster collaborations. Next, governments should prioritize ethical issues like adhering to Islamic principles, environmental considerations, and equitable access. Lastly, engage with international bodies, participate in research, and foster global consensus. By

implementing these recommendations, Malaysia can responsibly manage GMFs, leveraging their potential while upholding ethical and environmental concerns.

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