

## **Maqasid Shariah in Modern Biotechnology Concerning Food Products**

MOHD IZHAR ARIFF MOHD KASHIM & AHMAD MUHAMMAD HUSNI<sup>1</sup>

### ABSTRACT

*The development of modern biotechnology in food occurs rapidly simultaneously with the development of other technologies. As a result, a wide range of modern foods using biotechnology engineering technique has been produced. It is also recognisable, modern food that produced through this technique has its advantages and disadvantages. However, there are some products that are produced by mixing the halal (clean) and haram (unclean) things. Therefore, it raises doubt on Muslims whether it is permissible in Islam or not. Thus, a descriptive, comparative, and content analysis of the fiqh (maqasid sharia) and science (biotechnology) sources have been carried out so that the product meets the syarak (law). Through the study, any food products produced through modern biotechnology, such as genetically modified foods must meet the criteria set by the texts (al-Quran and Sunnah) and also in accordance with the maqasid sharia. The products must be taken from halalan tayyiban (allowed and clean) sources. In addition, it must be beneficial to human health, life, finance, and so on without neglecting the halalan tayyiban principle. Besides, it must be harmless to human because anything that bring harm to humans is forbidden in Islam.*

*Keywords: biotechnology, food products, halal food, maqasid shariah*

Foods is the most important requirement for humankind on earth. Therefore, people are willing to do different types of efforts to find good sources of food for their families. Individual and family efforts began to be forgotten when human civilizations developed. A wide range of modern technologies in the production and supply of food products that are more efficient already exists. Modern biotechnology is amongst the technologies currently being developed around the world.

United Nations (UN) have agreed to create a new definition more clearly in relation to the word 'biotechnology' in the Convention on Biological Diversity (CBD). They define biotechnology as an attempt to use variety of technologies on biological systems or living organisms for specific use. This definition adopted by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) (Macer 2003).

History has shown that biotechnology has been adopted by previous civilizations likewisethe time of Prophet Muhammad. This is because the production of alcohol, vinegar, bread, cheese, yogurt, and so on are part of the classical or traditional biotechnology processes (Fari & Kralovanszky 2006).

Modern biotechnology is a process involving molecular processes, genomic, genetic modification, DNA, breeding using molecular markers, cloning, bioprocessing, cell reproduction, and

---

<sup>1</sup> **Mohd Izhar Ariff Mohd Kashim**, Ph.D., senior lecturer at Department of Syariah, Faculty of Islamic Studies, Universiti Kebangsaan Malaysia, 43600 BANGI, Selangor, Malaysia, e-mail: [izhar@ukm.edu.my](mailto:izhar@ukm.edu.my); **Ahmad Muhammad Husni**, Ph.D., senior lecturer at Department of Syariah, Faculty of Islamic Studies, Universiti Kebangsaan Malaysia, 43600 BANGI, Selangor, Malaysia, e-mail: [ahmedking25@ukm.edu.my](mailto:ahmedking25@ukm.edu.my).

so on. Products produced by using modern biotechnology or genetic engineering process known as Living Modified Organism (LMO) means Genetically Modified Organisms (GMO). Cartagena Protocol clarifies that (LMO) products has been defined as a living organism that has a new combination of genetic material. It is obtained through modern biotechnology methods which did not exist in earlier times. Products produced by this method will be called as genetically modified foods, better known as Genetic Modified Food (GMF) like GM soy and transgenic tomatoes (Convention on Biological Diversity 2010).

A study has been conducted by economic experts shown that the development of modern biotechnology is able to drive the developing countries by 2020. This is because there are numerous benefits and positive impact on the economy to a country. There is also positive impact on other aspects such as maintaining food quality and safety, increase quality of life and human health. Furthermore, when this field is able to reduce a country's dependence on supplies of fossil fuels and overcome the problem of environmental pollution at once. From the outcome of positive achievements in the field of biotechnology to the country, the government, under the Ministry of Science, Technology and Innovation has established an agency called BiotechCorp to ensure the biotechnology industry in the country develop in well planned and orderly. These agencies are the property of the Ministry of Finance, which is reported to have helped the development of biotechnology in Malaysia. Among the results were in 2010, not less than one hundred and fifty local biotechnology companies with BioNexus status has been established. Each company was able to generate transactions worth more than RM500 million, either at national or at international level (Lokman, 2010). It is more proudly when over a third of companies BioNexus since 2008 is comprised of companies that focus on the areas of medical and health biotechnology (BiotechCorp 2009).

Based on these studies, it can be described that the field is very helpful to improve productivity and the country's economy in various sectors such as agriculture, medicine, food industry, farming and many more. Therefore, Malaysia among the countries which so vigorously in expanding the field of modern biotechnology to get in line with the establishment of the National Biotechnology Policy, which was introduced in 2005. However, as a first step, the government is more focused in the field of agricultural biotechnology in line with the National Agricultural Policy since 1984. Recently, the government has begun to focus on other areas of modern biotechnology such as medicine and food industries. All of this is to ensure that countries achieve the target as desired. These goals can not be separated from the *Syariah Law*. *Syariah Law* connected to all of these things must be inspected thoroughly in order to be in line with the foundation of Islam.

Any effort in developing biotechnology industry must be inspected thoroughly in every aspect. The aim is to ensure that Muslims do not get stuck in the mire of destruction and Allah's wrath. Allah says in the Holy book of al-Quran in Surah al-Maidah, verse 4:

They ask you, [O Muhammad], what has been made lawful for them. Say, "Lawful for you are [all] good foods.

This verse clearly shows that the importance of in-depth studies carried out in all food products, whether they are based on modern biotechnology or otherwise. Any Islamic food products can not be lawful only through *maslaha* argument and *maqasid shariah* alone. All arguments should be taken in advance from the al-Quran and Sunnah. Therefore, research should be done so that the government's efforts in generating wealth are not in conflict with the Islamic principles thus meet the requirements of a real *maqasid shariah*.

## Modern Biotechnology in Foods

There are some foods produced by using modern biotechnology. It is better known as Genetically Modified Foods (GMF). Some are based on animals and some plants. All these efforts have successfully developed by whether local and west scientists in order to achieve the aspirations and objectives of a developed country.

Agricultural biotechnology products are one of the main biotechnology products developed by the developed countries. It is one of the branch of technology that has the potential to deliver superior returns. Through genetic engineering, the crops can be improved its positive features such as resistance to herbicides, insects and able to withstand various types of extreme weather climate. For example, climate change on drought, floods and extremely hot or cold temperature (Uzogara 2000).

In addition, there are also efforts to make the first commercialized transgenic tobacco in China in 1992, followed by tomato Flavr Savr GM in the US in 1994 (Jan-Peter Nap et. al. 2003). As the many benefits derived from transgenic tobacco, several other GM crops were also commercialized like GM soybeans, GM rice, GM maize, GM papayas (James 2009) and GM brinjal (Choudary et al. 2014). James (2013) reported that the number of countries planting genetically modified plants has increased from six countries in 1996 to eighteen countries in 2003. It kept growing as its volumes continue to increase to twenty countries in 2013. From twenty-seven countries involved with GM crops, nineteen of them consist of developing countries such as Brazil, Argentina, India, China, Mexico, Myanmar, the Philippines, Cuba, Costa Rica, Guatemala, Honduras, Columbia, Sudan and Pakistan, while the remaining nine other countries consist of industrial countries like the United States, Canada, Australia, Spain, and Portugal (James 2013). In addition, the global area of GM crops was also reported increased consistently from 67.7 million hectares in 2003 (James 2003) to 134 million hectares in 2009 and subsequently reached 175 million hectares in 2013 (James 2013).

All of this efforts are conducted through organism genes transfer to other genes. Transferring certain genes into certain plants has been underway in seven countries in Asia such as China, India, Indonesia, Malaysia, Pakistan, Philippines, and Thailand. Thereafter, it was followed by four more countries in the African continent such as Egypt, Kenya, South Africa and Zimbabwe. Another four countries such as Argentina, Brazil, Costa Rica and Mexico were developed by Latin America Region (Cohen 2005). It was reported that Argentina, Egypt, the Philippines, Brazil, India, South Africa, China, Kenya, Thailand, Costa Rica and Mexico also do some research on transgenic plants such as sweet potatoes, cotton, potatoes, tobacco, eucalyptus, rape seed, tomatoes, corn, rice, wheat, watermelon and soybean. However, Cohen (2005) has pointed out that nowadays gene transfer is often done focused on cash crops such as rice, potatoes, corn and papaya.

Until 2013, the main GM crops actively commercialized is soybean, which is globally reach 84.5 million hectares and planted in 11 countries as well as corn products which is global acreage of 57.4 million acres planted in 17 countries. As for cotton global acreage is 23.9 million acres and planted in 15 countries and canola (global area of 8.2 million hectares and planted in 4 countries (James 2013). Teng (2008) reported that the Asia planting about 5 million hectares of plants in 2006. Cotton, corn and canola is an approved GM plants to be grown in the area in Asia (Teng 2008). However, James (2013) reported that the number has increased by no less than 19 million hectares, with India is the Asian country with the highest GM acreage of 11 million hectares. Bangladesh is the latest Asian country to allow the cultivation and commercialization of GM eggplant in their countries, making them the first country in the world to do so (Choudhary et al. 2014).

According to Lim (2009), GM plant in Malaysia has been developed by a number of research institutions such as MARDI. It has successfully developed the GM papaya (delaying fruit maturity, virus resistant), GM pineapple ('Blackheart' disease resistant), GM orchids (prolong the life of flowers and colors, virus resistant), GM rice (resistant to floods, drought, high temperatures), GM pomelo (improving its color), GM passion fruit (virus resistant), GM chili (virus resistant) and GM mangosteen. In addition, MARDI has also produced more than 50 technologies related to agricultural biotechnology (Rozhan and Daud, 2007). Malaysian Palm Oil Board (MPOB) has been successfully developed GM palm oil (high oleic acid content), Malaysian Rubber Board (MRB) to develop GM trees (human albumin serum antibodies against tooth decay) and Forest Research Institute Malaysia (FRIM) to develop GM teak trees. In terms of imports, so far only five authorized GM products in the Malaysian market such as *Roundup Ready* soybeans for food, feed and processing (FFP), Bt maize MON 810 (FFP), maize NK603 *Roundup Ready* (FFP), Bt maize MON 863 (FFP), and protein for ice structuring (a copy of protein from fish) extracted from GM yeast for use in Unilever ice cream (Lim, 2009).

### **Effects of Biotechnology Products to Muslims**

Amongst scientists themselves, they differ in explaining the views of the impact of modern biotechnology in food products, which is known as the GMF. Some say it was very good and some as the greatest plague of this century.

#### *The Benefits of Genetically Modified Foods (GMF) to the Economy*

In reality, genetically modified food (GMF) is produced as a step to meet the needs and demands of a growing world population, while improving the quality and quantity of food. The aim is also to provide food assistance to children suffering from malnutrition in the third world countries such as Africa. Currently, more than 842 million people, or two thirds of the world's population suffering from hunger and malnutrition, while 1.3 billion people fall into the category of poor with per capita income of less than \$1 a day (The Royal Society 1999).

Genetically modified foods are products produced by agriculture based multinational companies through genetic engineering. Through research, these companies have managed to produce plants seed which is better than plants derived from natural seed. It is an effort to increase biotechnology productivity and promoting biotechnology plants in the international market at once. The company claims that the genetically modified product produced is good and safe for the reasons given, which can help to reduce hunger and there is no different from natural plants. In addition, genetically modified foods can also improve the quality of nutrition, namely to ward off serious illness. Genetic engineering technology used by scientists managed to produce plants that are not easily broken, increase food production and thus lead to reduce genetically modified food's costs. Thus, farmers can obtain higher profits and beneficial to the environment. There is also a genetic engineering technology introduced to address the problem of environmental pollution such as oil spill. For example, the production of transgenic bacteria capable of producing enzymes to decompose various hydrocarbon compounds in oil that spilled into the sea.

According to the US National Nutrition Agency (USFDA) through their paper titled "Border biotechnology from the perspective of humanity". Initially, the plants were genetically engineered to produce significant changes to the constituents of the content or whole foods. For example, there was an increase in minerals and antioxidants such as carotenoids, flavonoids and Vitamin A, C and E in plants of this type. These materials help slowly down or reduce the rate of oxidation processes, besides delay damages that caused by chemical reactions. This is because vegetables and fruits

produced through genetic engineering process will last longer on the market compared to vegetables or fruits produced through organic crops (USFDA 2010).

### *The Disadvantage of Genetically Modified Foods (GMF)*

Genetically modified food (GMF), particularly animal-based products are the main focus in debate amongst whether scientists or Islamic scholars. This is because there is a view that says that there are negative side effects despite the greatness of modern technology. Amongst the negative consequences to which it relates, that human health will be affected for a long period of time, in addition to be a threat to the stability and balance of nature (Wan Jasimah 2002).

European Union (EU) countries have rejected GMF completely without any compromise either found in plants or animals. This is because their faith in the indictment explains that the GMF has high potential to cause harm to human health based on studies that have been done by some scientists in Europe. It is more convincing when the United Nations Food and Agriculture Organisation (FAO) has shown that alternative food than GMF still able to meet the needs of the world's population by the year 2030. It is more convincing when the European countries that rejected GMF in their countries, most of those countries hit by the outbreak of mad cow disease (BSE) in the early 90s. On that basis, they argued that if the gene is found in cow's modern food produced through GMF would impact on human health, especially the European peoples (UCSUSA 2005).

According to Arpad Pusztai (a scientist in the field of bio-chemistry), GMF can leave negative impacts on human health as a result of the influence of foreign DNA that have mingled in the GMF products. This argument is further strengthened when he made a detailed study to 40 laboratory rats. Those rats were fed with first transgenic tomato products produced by Calgene called Flavr Savr. The study found that seven of 40 rats had died with unknown causes of the disease. He believes that if biotechnology is implemented by most countries, it is likely to threaten human life on earth (American Institute of Biological Science, 2005). In addition, Arpad Pusztai has conducted similar studies on laboratory rats for few times but this time he fed the rats with transgenic potatoes. Resulted most of the rats suffered serious health problems such as damage to the immune system, kidney become smaller, while also stunted its growth.

Thus, these studies have raised objections from various quarters, including amongst Britain's politicians and scientists. In addition, the study also raised objections from independent academy of science based in the United Kingdom known as The Royal Society. The Academy claimed that the studies conducted by Arpad Pusztai was unorganized and disorder, in addition to having many weaknesses in many aspects of science (The Royal Society, 1999). Therefore, it is described that there are incomplete disagreements until this day amongst western scientists (Yaakup Che Man, 2011). Furthermore, the scholars also disputed about the determination of the legal opinion in food products derived through modern biotechnology. Thus, the GMF issues is difficult to determine (Tamyas Abd Wahid 2011).

Through research, scientists have concluded that genetically modified food has deficiency that could lead harm to human and environmental. According to Edwin Chargoff father of molecular biology), genetic modifications in food is the largest experiment and most dangerous in human history. He also noted that the renovation of food technology as a threat larger than nuclear technology. American Medical Association has also issued a similar statement on the possibility of GMF process is capable of causing environmental damage. Among the concerns that have been reported are likely about virus resistant crops produced by GM and GE (genetic engineering). The virus may mutate into a new form that is more dangerous and can attack plants and other living things.

There are many impacts from GMF food production such as allergies, toxic levels and increased antibiotic resistance and side effects of different contingencies. However, it was originally harmless to the body but it can create killer toxins. The bacteria that have been genetically engineered (GE) for the purpose of generating additional food in large quantities is L-tryptophan. This bacteria produces a toxin that has killed more than 30 people and maimed more than 5,000 people in the United States before its withdrawal, it is also banned by the Food and Drug Administration (FDA).

In a different study, a group of Japanese scientists has created a foreign gene where it was used as an agent of the originating process in genetic engineering. It may be able to change the nutritional content of food in ways that are not anticipated. For example, reducing the amount of certain nutrients and increasing other nutrients. Antibiotic resistance may occur because the genes used in some plants that has been modified may transfer diseases. This caused by microbes in the intestine of humans or animals that consumed genetically modified foods. This process is also likely to contribute to the development of public-health problem because of resistance to this antibiotic will be transferred to humans through consumption of food produced through genetic engineering methods (WHO 2010).

In the United States, there is a new discovery that shows farm crops modified through genetic engineering processes have shown a high level of resistance and outstanding against the destructive plants poison such as herbicide and pesticide poison. If left unchecked, it is likely to apply cross-linked with other species and would produce a new form of wild plants that are difficult to be destroyed. Thus, the situation will require people to create a more powerful poison to control it and will indirectly harm the environment.

Another study conducted by Michigan State University found that crops produced through a process of GM and GE aims to protect plants from virus infection. However, its impact on health and the environment will result in the virus mutates to a form a new, more dangerous and capable of invading species of plants and other living things. Even so, the foods produced through biotechnology methods can not be separated from the halal and haram. In Surah al-Baqarah verse 172, Allah says:

O you who have believed, eat from the good things which we have provided for you and be grateful to Allah if it is [indeed] Him that you worship.

Al-Quran and al-Sunnah looked about clean and unclean foods as a large thing and capable of affecting the life here and hereafter. According to Islam, the question of halal and haram food depends on the basis of the food, that is how it is produced, from what it is produced and who produced it (JAKIM 2010).

Besides, biotechnology products can also lead rich countries to exploit poor countries in terms of economic or political. This condition occurs when importing countries rely heavily on exporting countries to supply the relevant biotech products, particularly products that involve GMF and daily use products. In 2000, such threats really happen, statistics has shown that 98 percent stakes in the world's transgenic crop market is controlled by six giant agrochemical companies, namely Mosanto, Syngenta, Bayer, DuPont, BASF and Dow (WSWS, 2011: 9). Moreover, the process of genetic engineering is used to stimulate the production of biological weapons from bacterias, viruses and fungus. The aim is to weaken and kill people during the war. Among the biological weapons agent has ever produced are *Yersinia pestis* (plague), *Tularemia*, *rift valley fever*, *Coxiella Burnett* (Qfever), *eastern equine encephalitis*, *Anthrax* and *Smallpox* (WSWS 20119).

### **Maqasid Shariah in Determining the Current Law**

*Maqasid al-Sharia* (Islamic objectives) and *maqasid al-syaari* '(the objectives of Islamic laws). Both words used to express the same meaning. In the Arabic language, *maqasid* are plural from *maqasid qasad, yaqsud, qasdan and maqsadan*. *Al-qasid* from the point of language have multiple meanings. Among them, aspire (*al-i'tizam*), holding (*al-i'timad*), willfully (*al-Amd*), ask for something and bring something (Husni 2012).

*Maqasid* is a goal to be achieved in doing something. In this context, *maqasid* defined as goals and objectives laid down by the legislation to ordain laws. There are various definitions have been made by scholars of jurisprudence on the *maqasid* term. But earlier scholars did not give a specific meaning for *maqasid*, even al-Syatibi (famous as the man who pioneered the *maqasid*) also never give specific definition to the notion of *maqasid shariah*. However, it does not mean that earlier scholars did not pay attention to the *maqasid* in formulating Islamic laws. They have issued several of opinions to explain the meaning of *maqasid shariah*. The fact that should be understood that all *maqasid* adopted by the shariah scholars have clear values and contained in the al-Quran and al-Sunnah. For that reason, the scholars have applied those values to make *ijtihad* and determine laws.

### **Applications of Maqasid Shariah in Modern Biotechnology Products**

Islamic scholars have stated the fact that the elements of *Maqasid Shariah* do exist in products of modern biotechnology. Elements of *Maqasid* can be identified when there is a joint production of two products, namely the impact of *maslahah* and *mafsadah*. Izz Abd al-Din ibn al-Salam (2000) told that it can be explained in two ways, first; in *haqiqi*, means pleasure and delights. Second; in *majazi*, means somethings lead to excitement and passion. al-Shatibi defines *maslahah* as a process to ensure the continuity and completeness of a human life in all its aspects. There are also some scholars define *maslahah* as desired by the legislation benefited for humans to preserve religion, life, intellect, lineage and their property (Mohd Izhar 2015). Two important things can be inferred through the definition, which is the first; *maslahah* that focused on benefit, flavor and enjoyment to people, and second; *maslahah* as an argument and it must be believe with confidence not doubtful thoughts.

Islamic scholars have agreed that *maslahah* which meets the requirements of the legislation to be adopted. What we mean by *maslahah* is the preservation of the objective of the law, which consists in five things: the protection of religion, life, intellect, lineage and property (al-Shatibi, 1997). While *mafsadah* is a concept which is contrary to *maslahah* (al-Buti 2005). Therefore, *mafsadah* is rejected by Islam due to its harm effects on religion, life, intellect, lineage and property (Ibn `Ashur 2007).

However, not all *maslahah* can be used in the arguments to determine laws. This is because there is adopted *maslahah* and there is also rejected *maslahah*. On that basis, Islamic scholars have divided *maslahah* into three types. Each type must be truly understood in order to use in the issue of GMF, so it may not stray from the right path. The three types of *maslahah* are as follows (al-Tabarani 1983, vol. 8):

1. *Maslahat al-Mu'tabaroh* (*maslahah* accepted by Islamic law because there are supporting arguments from al-Quran and al-Sunnah).
2. *Maslahat al-Mulghah* (*maslahah* rejected by Islam because it is contrary to scripture, *ijmak* and *qiyas*).
3. *Maslahat al-mursalah* (*maslahah* that has no specific arguments about whether to accept or reject, but implicitly, it is intended by the legislation to be maintained)

### Only Accepted Modern Biotechnology Products which Bring Benefits

Any law found in al-Quran and al-Sunnah cannot be spared from the two items, that is *maslahah* and *mafsadah*. Both of these things are very important for determining a current law that there is no injunction in particular whether from al-Quran and al-Sunnah. Thus, Islam has always led people to seek *halal* because of the *maslahah* contained therein. The Prophet Muhammad said:

طَلَبُ الْحَلَالِ وَاجِبٌ عَلَى كُلِّ مُسْلِمٍ

Meaning: "Seeking halal is a duty binding on every Muslim" (al-Tabrani 1983).

Prophet Muhammad also described a place among those who eat unclean food will be put in hell as his word:

كُلْ لَحْمٍ نَبَتْ مِنَ الْحَرَامِ فَالنَّارُ أَوْلَى بِهِ

Meaning: "Every flesh nourished by haram deserves fire" (al-Bani 1999).

Any instructions and restrictions contained in Islamic law never miss out *Maqasid Shariah* to preserve human thus preventing any kind of *mafsadah* and minuses. All of the arguments above clearly illustrate how Islam preserve *maslahah* of his people in all aspects of life, including on the issue of GMF. Allah (s.w.t.) has ordered Muslims looking for good food, while avoiding all foods that are forbidden because of harm, dirt, unclean and dangerous. The purpose of this ban was to preserve the benefit of human life from destruction (al-Bani 1999) thus reflecting the true essence of *Maqasid Shariah* that should be maintained (al-Buti 2005). However, it is undeniable that every *maslahah* must comply with the conditions laid down by Islam so that it is not used in the wrong way.

### Conditions for Practicing *Maslahah* in Modern Biotechnology Products

To clarify the matter, al-Buti (2005) has outlined three essential conditions for practicing *maslahah* in order to meet *Maqasid Shariah*. These conditions can be applied to the process of determining the law to all modern biotechnology products such as GMF and others. Some of them are as follows:

#### a. *Maslahah must not contradict with the al-Quran dan al-Sunnah*

Every *maslahah* that oppose these two major sources will be rejected even though it had many advantages or benefits. This is due to these two main sources are the most important reference in Islamic law. It should be noted that all the instructions in the al-Quran and al-Sunnah will not be separated from maintaining *maslahah*, as well as keep them away from all *mafsadah*. Allah says in the al-Quran (4: 105):

We have sent down to you the Book containing the truth, in whose light you should judge among the people as God has shown you, and do not be a contender for deceivers.



The word '*litahkuma bayn al-nas*' in the verse means that Islam requires its followers to refer any matter to the al-Quran before determining any laws. Hence, *maslahah* or any goods in GMF product can not be lawful if the materials contained therein conflict with the scriptures (al-Quran & Sunnah).

*b. Maslahah must no contradict with ijmak and qiyas*

*Ijmak* and *qiyas* are decisive legal instrument which has been certified by the al-Quran and al-Sunnah. Everything that contradicts the two determinants of these laws are rejected despite there is *maslahah* in the product. After a law was agreed by scholars then there is no chance to see any errors happened. Allah says in the al-Quran (4: 14):

And whoever disobeys Allah and His Messenger and transgresses His limits - He will put him into the Fire to abide eternally therein, and he will have a humiliating punishment.

This verse shows that every legal decision that has been determined by the provisions of the Prophet (s.a.w.) through revelation must be obeyed. Similarly, *ijtihad* conducted in accordance with the agreed texts and principles of *ijtihad* should be followed. Those who refused all legal decisions are included in the group that lost and misguided.

*c. Maslahah must not exceed maqasid or larger maslahah*

*Maqasid shariah* is intended to keep *maslahah* and prevent from mafsadah. *Maslahah* can only be achieved by keeping the most valuable thing in the life of a human being, namely the five principles of *shariah* (*al-daruriyyat al-khams*) (al-Buti 2005). The five values in question are the protection of religion, life, intellect, lineage and property. Thus, if these five things can be maintained, then it is included in the *maslahah*, if otherwise is included in mafsadah (harmful and illegal to approach) (al-Buti 2005).

This condition is usually applied when there is a clash between two illegal things. If the collision happens involves two illegal things such as produces GMF from carcasses DNA and let a group of people starves to death, then choose one of the two things which were more important than the other one even though both were illegal. To solve the problem, wisely choose between one of the two illegal things. After analysis, it was found that the use of DNA carcasses is more practical and need to be prioritized instead of allowing a number of people died of starvation. In another context, the risk of eat carcasses was lower than let people die while there is already way out in front of the eye. Thus, it is clear that the use of *maslahah* must not conflict with the *maqasid* or larger *maslahah* though both allowed by Islam during an emergency.

**The Importance of *Maslahah* in Modern Biotechnology Products to Preserve Human Being**

The purpose of *Maqasid Shariah* is to maintain the *maslahah* (benefits) of mankind on earth. On the issue of biotechnology products such as GMF and so on, *maslahah* that want to be preserve is the life or soul. To preserve these basics, Islam has allowed all kinds of *halal* and good foods. This statement has indirectly rejected any kind of food that can harm human's life and health. At the very beginning, Islam has forbidden its people to eat foods that are harmful, dangerous, dirty and unclean either directly or mixture of *halal* with *haram* substances. All these restrictions bring *maslahah* and

distancing them from any harm and *mafsadah* at once. However, this prohibition will change its law if they are in an emergency situation which will bring negative effects to human lives.

In this context, the jurists have agreed to authorize the use of illegal animal-based substances in the production of GMF products in case of an emergency. The conditions prescribed are as follows (Hayatullah et. al. 2012):

1. There are no *halal* sources that can challenge *haram* sources.
2. Believes that if do not using the *haram* substance it will cause death.
3. The use of *haram* sources is just to escape from famine by *sadd al-ramq* (save lives).
4. Must look for *halal* foods while capable.

If we look closely on the condition, it appears that something *haram* (illegal) may turn out to be *halal* for a little while in an emergency situation. It should be noted that taking an illegal source is not counted as *maslahah* but it is actually *mafsadah* which is smaller than bigger *mafsadah*. All of this is to preserve *maqasid* and greater *maslahah*, namely life. Accordingly, all types of GMF products based on animals' feces to be examined on its needs in a Muslim country. If it is a product that is needed to preserve human life, then the use of the GMF products is lawful according to the principle of *darurat* (emergency) based on Islamic law. According to al-Suyuti, unlawful things has become common amongst men, thus make it difficult for Muslims to consume it. If they do not get it, it will cause them to suffer in enormous trouble. Therefore, allow it to continue is advisable to maintain a greater harm than prevent it (Mustafa 2015).

As a conclusion, every law that is passed down is to protect human welfare from every corner of human life. It shows Islam is a religion that emphasizes the survival of his people from every corner of life including issues relating to the issue of food produced through modern biotechnology. Each modern food products must be in accordance with the principles of *maqasid shariah*, which has been established by Islam. Moreover, Islam has outlines specific guidelines for its followers to eat clean, healthy, nutritious food to maintain a healthy body as well as the relationship between creature and creator. This is because the goal of *maqasid shariah* is to preserve benefits for human, and prevent them from harmness. Therefore, as Muslims, Allah's commands and prohibitions must be followed to get His blessings.

In line with these principles, the al-Quran and al-Sunnah as a basic guide to the Muslims throughout the ages. After the study, it has been proven that the Qur'an and Sunnah do not discuss the law of modern biotechnology in particular. The discussion contained in these two sources are more general so that it can be used as evidence against new issues such as modern biotechnology products. Therefore, it is not wrong if the rules determining the law in Islam such as *ijtihad*, *fiqh*, *maqasid shariah* used to determine the legal status of modern biotechnology products.

Under those rules, the perfection of Islam is clearly highlighted when the existence of other authoritative sources that can be consulted to facilitate contemporary scholars to make *ijtihad* in resolving new issues for Muslims. This is called as *maqasid syariah* in addressing new and current issues. However, it is still subjected to the principles described by the Quran and Sunnah thus not contrary to Islamic law.

Today, *Ijtihad* is widely used to solve contemporary law issues whether it is lawful or otherwise. Especially on issue that there is no detailed discussions in the Quran or the Sunnah. Therefore, Islamic scholars had to take variety of approaches and methods including the use *maqasid sharia* to solve problems that arise within Muslims. In the context of food products such as GMF and so on, it can not be detached from the *halalan tayyib* principle. Those concepts not only lead to dietary sources alone, but also lead to importance issues such as hygiene, general or specific benefit and

should not bring harm. For that reason, Islam ordered its scholars to review all facets of the legal determination so it follows accordingly to Islamic law. Even more dangerous when the scholars forbid something legal or justify the unlawful.

Accordingly, the determination of modern biotechnology products like GMF does not simply taken according to the *maqasid sharia* alone. Determination of the product is based on the criteria laid down by the texts which is Al-Quran and Sunnah. Amongst them: *Halalan tayyiban*. If the original gene found in the products of modern biotechnology taken from halal sources such as halal plants and animals, then they are halal for muslim to consume or otherwise it is haram for consumption and other indirect uses. Secondly, give benefits to people in all aspects of life. This means, all kinds of products of modern biotechnology must be identified will leave a positive impact on all aspects of human whether health, life, financial and so on. As a results of the studies, the products of modern biotechnology are able to make a better lifestyle for human being. In fact, some of these products could save many lives through modern biotechnology in medicine. However, the origin principles of *halalan tayyiban* be maintained in order to preserve *maqasid sharia* in human life. Thirdly, harm to five aspects of *maqasid sharia* do not dominate *maslahah*. Thus, each of the products of modern biotechnology that is believed to cause harm to humans is *haram* and rejected immediately.

### Acknowledgment

This study is financed by the Fundamental Research Grant Scheme (FRGS) (FRGS/2/2013/SS103/UKM/03/2). UKM.

### References

*Al-Qur'an*.

- American Institut of Biological Science. 2005. Genetically modified foods: are they a risk to human/animal health? <http://www.actionbioscience.org/biotech/pusztai.html> [Retrived: 25 Dec. 2005].
- al-Bani, Nasir al-Din. 1999. *Sahih al-Jami'*, Kitab al-at'imah, bab akl haram. Vol. 1. Beirut: Dar al-Fikr.
- Biologymad.com. 2011. Designed for student studying AQA, <http://www.biologymad.com> [Retrived: 1 Jan. 2011].
- Biotech Corp. 2009. Overview: Malaysian Healthcare Biotechnology. *The Malaysia Healthcare Biotechnolgy Sector, A Frost & Sullivan Whitepaper*. Kuala Lumpur: Malaysian Biotechnolgy Corporation Sdn. Bhd.
- al-Buti, Muhammad Sa'id Ramadan. 2005. *Dawabit al-Maslahah fi al-Shari'ah al-Islamiyyah*. Damsyiq: Dar al-Fikr.
- Choudhary, B., Nasiruddin K. M. & Gaur, K. 2014. The Status of Commercialized Bt Brinjal in Bangladesh. ISAAA Brief No. 47. New York: ISAAA.
- Cohen, J. I. 2005. Poorer nations turn to publicly developed GM crops. *Nature Biotechnology*. 23: 27-33.
- Convention on Biological Diversity. 2010. Article 3. Use of Termss (The Caartagena Protocol). <http://bch.cbd.int/protocol/text/article.shtml?a=cpb-03> [Retrieved: 4 July 2011].
- Fari, M.G., Kralovansky, U. P. 2006. The founding father of biotechnology: Karoly (Karl) Ereky. *International Journal of Horticultural Science*. 12 (1): 9-12
- Hayatullah Laluddin, Mohamad Nasran Mohammad, Zuliza Mohd Kusrin, Shofian Ahmad, Zaini Nasohah, Mohd Zamro Muda, Md Yazid Ahmad & Ahmad Muhammad Husni. 2012. An

- analysis of maslahah's development through al-Ghazali pre and post al-Ghazali Periods. *International Business Management*. 6(2): 187-193.
- Husni, A. M., Amir Husin, Mohd. Nor, Abdel Wadoud Moustafa Moursi El-Seoudi, Ibnor Azli Ibrahim, Hayatullah Laluddin, Muhammad Adib Samsudin, Anwar Fakhri Omar, Muhammad Nazir Alias. 2012. Relationship of maqasidu al-shariah with al-qesas and diyah: analytical view. *The Social Sciences*. 7(5): 725-730.
- Ibn `Ashur, Muhammad Tahir. 2007. *Maqasid Shari`ah al-Islamiyyah*. Cairo: Dar al-Salam.
- al-'Izz ibn Abd al-Salam. 2000. *Qawaid al-Ahkam fi Masalih al-Anam*. Beirut: Dar al-Makrifah.
- al-Ghazali, Muhammad Muhammad. t.th. *al-Mustasfa fi `Ilm al-Usul*. Vol. 1. Cairo: Dar al-Haramayn. Vol. 1.
- JAKIM. 2010. Bioteknologi dalam makanan dan minuman. <http://www.e-fatwa.gov.my/fatwa-kebangsaan>. [Retrieved: 11 November 2010].
- James, C. 2003. Global Review of Transgenic Crops in 2003. ISAAA Briefs No. 30. New York: ISAAA.
- James, C. 2009. Global Status of Commercialized Biotech/GM Crops: 2009. The first fourteen years, 1996 to 2009. ISAAA Briefs No. 41. New York: ISAAA.
- James, C. 2013. Global Status of Commercialized Biotech/GM Crops: 2013. ISAAA Brief No. 46. New York: ISAAA.
- Jan-Peter Nap, Metz, P.L.J., Escaler, M. & Coner, A.J. 2003. The release of genetically modified crops into the environment: Part 1. Overview of current status and regulations. *The Plant Journal*. 33 (1): 19-20.
- Lim, L. C. 2009 GM crops increase pesticide use. <http://www.isis.org.uk/GMCIPU.php> [3.4.2010].
- Lokman, O. 2010. Potensi industri bioteknologi. Utusan Online. [http://www.utusan.com.my/utusan/info.asp?y=2010&dt=0524&sec=Rencana&pg-re\\_05.htm](http://www.utusan.com.my/utusan/info.asp?y=2010&dt=0524&sec=Rencana&pg-re_05.htm). [Retrieved: 21 Jan. 2014].
- Macer, D. 2003. Ethical, legal and social issues of genetically modified disease vectoes in public health. World Health Organization on Behalf of the Special Programme for Research and Training in Tropical Diseases.
- Mohd Izhar Ariff Mohd Kashim, Latifah Abdul Majid, Airil Haimi Mohd Adnan, Ahmad Bin Muhammad Husni, Zaini Nasohah, Mohd Adib Samsudin & Muhammad Zaini Yahaya. 2015. Principles regarding the use of *haram* (forbidden) sources in food processing: a critical Islamic analysis. *Asian Social Sciences*. 11 (22): 17-25.
- Mustafa `Afifi b. Ab Halim, Mohd Izhar Ariff bin Mohd Kashim, Mohd Mahyeddin Mohd Salleh, Norhaslinda bt. Nordin & Ahmad bin Muhammad Husni. 2015. Halal pharmaceutical. *The Social Sciences*. 10 (4): 490-498.
- Rozhan Abu Dardak & Daud Othman. 2007. Business potential for agricultural biotechnology porduts in Malaysia. In. *Report of the APO multi-country study mission on the business potential for agricultural biotechnology products*. Tokyo: Asian Productivity Organization.
- al-Shatibi, Ibrahim Musa. 1997. *al-Muwafaqat fi Usul al-Shari`ah*. Vol. 2. Beirut: Muassasat al-Risalah.
- al-Tabrani, Sulayman Ahmad. 1983. *al-Mu`jam al-Awsat*. Kitab talab al-halal, Bab talab al-halal faridah. Vol. 8. Beirut: Muassasat al-Risalah.
- Teng, P. 2008. An Asian Perspective on GMO and Biotechnology Issues. 17 (81): 2.
- Tamyas Abd Wahid. 2011. Garis panduan dalam penentuan hukum GMF berasaskan haiwan, Pejabat Mufti Selangor, Shah Alam, Selangor. Interview. 14 Mei.
- The Royal Society. 1999. Ref. 11/99, Review of data on possible toxicity of GM potatoes, [http://royalsociety.org/uploadedFiles/Royal\\_Society\\_Content/policy/publications/1999/10092.pdf](http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/publications/1999/10092.pdf) [Retrieved: 1 Januari 2011].

- UCSUSA. 2005. Union of concerned scientists, [http://www.ucsusa.org/food\\_and\\_environment/genetic\\_engineering/world-food-supply](http://www.ucsusa.org/food_and_environment/genetic_engineering/world-food-supply) [Retrieved: 27 Dec. 2005].
- USFDA. 2010. Sempadan bioteknologi mengikut perspektif kemanusiaan, [www.usfda.org](http://www.usfda.org) [Retrieved: 22 March 2011].
- Uzogara, S. G. 2000. The impact of genetic modification of human foods in the 21<sup>st</sup> century: A review. *Biotechnology Advances*. 58(2): 179-206.
- Wan Jasimah Wan Mohammed Radzi. 2002. Makanan ubah suaian genetik: perspektif kesihatan dan keselamatan makanan. Working paper. Seminar Muzakarah Pakar Food-Satu Perspektif Islam. Organized by Anjuran Institut Kehakiman Islam Malaysia (IKIM), IKIM, Kuala Lumpur, 29-30 May.
- Wikipedia. 2005a. Genetically modified food, [http://en.wikipedia.org/wiki/Genetically\\_modified\\_food](http://en.wikipedia.org/wiki/Genetically_modified_food) [Retrieved: 27 Dis 2005].
- Wikipedia. 2005b. Genetically modified food, [http://en.wikipedia.org/wiki/Genetically\\_modified\\_food](http://en.wikipedia.org/wiki/Genetically_modified_food) [Retrieved: 16 Mei 2012].
- WHO. 2010, Ubah suai kandungan nutrien makanan, <http://www.who.org> [Retrieved: 1 Jan. 2011].
- WSWS. 2011. Kesan bioteknologi, <http://www.wsws.org/articles/2003/jul2003/gmf-j02.html> [Retrieved: 1 Jan. 2011].
- Yaakup Che Man. 2011. Kaedah penghasilan produk GMF, Institut Halal Universiti Putra Malaysia, Serdang, Selangor. Interview. 22 June.