Food safety issues in Islam

M. Mufizur Rahman\textsuperscript{a*}, Mst. Minara Khatun\textsuperscript{a}, M. Hasibur Rahman\textsuperscript{b}, Nazma Parvin Ansary\textsuperscript{b}

\textsuperscript{a}Department of Microbiology and Hygiene, Bangladesh Agricultural University, Mymensingh, Bangladesh.
\textsuperscript{b}Community Based Medical College, Mymensingh, Bangladesh.

*Corresponding author; Department of Microbiology and Hygiene, Bangladesh Agricultural University, Mymensingh, Bangladesh.

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A B S T R A C T

As regards food safety issues there is a distinct demarcation in Islam between lawful food allowed to Muslims and unlawful food not allowed to Muslims. With the increasing awareness of their Islamic dietary requirements, the Muslim consumers all over the world now demand more information on food sources and its processing. The Islamic Rules governing food show that they are simple and clear and can be applied easily in Muslim countries. Hygiene, sanitation and safety are important pre-requisites and Good manufacturing (GMP) or Good Hygienic Practice (GHP) is a compulsory requirement in preparing Halal food. The Global Halal Institute has a list of Halal certifiers that are approved by most Muslim countries with dietary import restrictions. Since the turn of the 21st century, there have been efforts to create organizations such as the Muslim Consumer Group that use the H-MCG symbol, with a view to identify the status of different edible and non-edible consumer products and certify food products as halal for Muslim consumers. The oldest and most well-known halal certifier in the USA is Islamic Services of America. In Europe, several organizations have been created over the past twenty five years in order to certify the halal products. These companies distribute halal-certified products. Halal certification gives Muslims evidences that their ingredients and production methods have been examined and tested and declared permissible by a certification body. It also gives authentication and permits companies to export products to most Middle Eastern and South East Asian countries.
1. Introduction

Muslims were commanded to maintain high standards of food hygiene

Food production and farming encompass a decisive safety issue that lies within the boundary of food ethics. In recent years we particularly experience that the animal farming is flourishing and has already occupied the space to become a critical topic in modern food processing (Rahman and Kabir, 2012). As a result the occurrence of concerns has risen due to the development of industrial animal agriculture affecting animal welfare, human health, food safety and the environment. Food safety issue is now an integral spectrum of food sustainability and viability; it aims not only to protect foods from undue contamination and food-borne illnesses caused by biologic elements such as viruses, bacteria and parasites, toxigenic substances and chemicals, but also to preserve the condition and quality of food, so that the resultant harmful effect from toxic biologic agents and chemicals that are transferred from food to the body could be reduced or prevented (Rahman, 2011).

Food safety is an inclusive aspect of food security

Food safety issue is inextricably connected with food security which may be defined as the state in which food is available to all members of society, allowing required sustenance and natural growth, and of a safe / acceptable quality that will not cause diseases or toxicity, all the year round and keep distribution at an affordable price/cost (Rahman and Rahman, 2012). To fight against the malady of poverty and malnutrition lying within the area of food security, a concerted effort is imperative; the struggle is reflected in Islam in the religious practice of zakāt (almsgiving) and in the institution of awqāf (Islamic religious endowments, charity) (Haddad, 2012). In addition, there are many reports of the Prophet (pbuh) in which he urges Muslims to give food to the poor. In one hadith he states that ‘the person who sleeps full stomach while his neighbor sleeps hungry is not a true believer’. Worldwide, hunger strikes more than 840 million people and food insecurity is becoming a major growing problem. Hunger lowers strength and blunts intelligence. It destroys many innocent lives, especially those of children. By weakening a nation’s workforce, hunger cripples a nation’s growth. Most hunger-affected countries are unfortunately located in Africa, south-east Asia, and the Middle East, with a high density Muslim population. The key goal in food security rests on reducing the number of undernourished. As defined in the World Food Summit-1996 “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” According to this definition the Bangladesh National Food Policy, 2006 categorized food security as: enhanced food availability, increased food access by the food insecure, and adequate supply of safe and nutritious food. Thus, food safety is an inclusive aspect of food security. Islamic food ethics bind food safety issues concept not only to struggle against poverty and world hunger, but also to achieve wholesomeness required for good food in terms of hygiene, sanitation and safety. We must need to adopt these aspects to be adhered to and implemented together. Prophet Muhammad (SAWS) commanded Muslims to maintain high standards of food hygiene and instructed keeping food and drink containers and utensils covered.

Islamic food ethics and safe foods

Universally it is agreed that Food Ethics takes aim to safeguard and preserve good health, and aims to prevent any harm to human beings, other-living beings and the environment. In this respect the Islamic food ethics is clear and is very much concrete and prominent focusing on concerns to food safety. Figure 1 represents diagrammatically the different frameworks of food ethics practiced in Islamic religion - the primary aim is obtaining safe foods for mankind, contributing to animal welfare and giving protection from environmental hazards.
The following factors influence Islamic food Ethics, emphasize food that is of good, wholesome and poor quality and aim to promoting, protecting the common good and interest of mankind and stressing on the fact that food produced is hygienic and permissible.

Factor 1

Islamic dietary directive

Food hygiene is an important part of Islamic dietary law and there is no denying the fact that food safety issue plays a vital role in Islamic way of life. This is clearly demonstrated in Islamic jurisprudence that specifies foods which are halāl ("lawful") and which are harām ("unlawful"). The specification is derived from commandments found in the Qur’an, the holy book of Islam, as well as the Hadith and Sunnah, libraries cataloguing things the Prophet Mohammed is reported to have said and done. Extensions of these rulings are issued, as fatwas, by Mujtahids, with varying degrees of strictness.

In Islam, halāl which not only encompasses food and drink, but all matters of daily life. When it concerns to halal food, most people think of meat products only. However, Muslims must ensure that all foods, particularly processed foods, pharmaceuticals and non-food items such as cosmetics are also halal. In many situations these products often contain animal by-products or other ingredients that are not permissible for Muslim consumption. As regards food safety issues there is a distinct demarcation in Islam between lawful food allowed to Moslems and unlawful food not allowed to Moslems (ref. the Holy Qura’n, 10:49; 16:114; 4:1, 4, 87, 88, & 96; 2:168). Allah allows and orders people to care about food quality in all forms and stages of handling: from choosing soil for cultivation (Qura’n, 7:48); storing pure / good food (Qura’n, 8:37; 4:100; 3:179); to eating good fresh food (Qura’n, 3:141; 7:147; 20:81); or using food wisely (Qura’n, 20:81; 17:27; 3:141; 7:31; 4:6). Masking quality, adulteration, and mischievous deeds (including food malpractice, adulterations, harm / damage /pollution and misbehavior) is not accepted in Islam and not loved by Allah (Qura’n, 28:77; 2:204). Allah calls upon people not to commit mischief in any form, and a Moslem should therefore not commit mischief (Qura’n, 2:60; 7:74 & 84; 11:84; 26:183; 29:36).
Food safety has been of concern to mankind since the dawn of history and this concern is growing as food-borne diseases has remain one of the most widespread public health problems in this contemporary world that we live in (Haddad, 2012; Rahman et al., 2014). For Muslims there is another issue that needs to be addressed and that is, the safe food must also be ‘Halal’ because their lives are guided by Islamic or ‘Shariah Law’. It is indispensable for them to consume only halal foods and avoid foods which are non-halal or haram. With the increasing awareness of their Islamic dietary requirements, the Muslim consumers all over the world now demand more information on food sources and its processing, as a result it makes good sense for food producers, processor and industries to shoulder the need of this trend by labeling the food properly and especially so, the regulatory bodies are consistently monitoring the authenticity of ‘halal’ foods sold in the market place.

**Factor 2**

**Basic concepts of Islamic rules governing foods**

As stated earlier that the two sources of Islamic Rules are the Quran and the sayings and the actions of the holy prophet (Sunnah or Hadith). Besides, Islamic Rules uphold some of the concepts in previous scriptures (Jewish Old Testament). Islam abolished idolatrous practices and offerings of food which were widely prevalent among pre-Islamic Arabs. These included dedication of foods to idols, sacrifices on altars devoted to deities, superstitious avoidance of certain animals or food grown in some fields. Moreover, cruel practices, such as cutting of humps, tails and other organs of living animals for use as food and drinking of blood drawn with canulas, are also forbidden. Some animals and manners of death or preparation can make certain things haram to eat. These include what are regarded as unclean animals such as animals that are sick, or have diseases like swine. Islamic Rules are guided on some general interpretations of the original rules given by learned Islamic scholars from time to time to apply them to different conditions of the time and places in which the Muslims live. Some general concepts of Islamic Rule are as follows:

- In principle, all clean and wholesome foods are permitted except for a few items which are expressly forbidden.
- Individuals may not eat certain permitted foods they do not like, but no one has the authority to declare them as forbidden for others.
- In case of extreme necessity (e.g., to save life) a forbidden food may be consumed but this should be strictly to getting over the emergency.
- Forbidden items and their derivatives remain forbidden regardless of their quantity or changes in their physical or chemical characteristics.
- It is forbidden to use tricks, stratagems and other types of deceit to make forbidden items permissible, e.g., by changing the name or appearance.
- Actions which lead to other forbidden actions are also forbidden. Example, manufacturing alcoholic drinks as well as their sale or giving them as gifts.
- Islamic Rules are to be observed by all Muslims rich or poor, ruler or the ruled alike and all over the world.
- As a general rule Muslims can eat foods of the ‘people of the Book’ – Christians and Jews, provided they do not contain forbidden ingredients, such as pork, carion, and blood that flows out.
- Foods known to be harmful to health or dangerous to life are forbidden.
- There is no objection to the mixing of permitted foods, e.g., milk, meat or fish, or consuming them in the same meal.
- As stated above the foods ordinarily permitted, however become unsuitable for consumption if dedicated to anyone other than Allah.
- Plant and mineral foods and beverages are permitted, if free from intoxicating and toxic substances, such as alcohol. Alcoholic drinks are specially mentioned because of their common and widespread use, but other substances affecting the nerve and mind (e.g., opium, cannabis etc) are similarly prohibited.
- Non-toxic fish, shell fish and other inhabiting the sea and freshwater are freely permitted. This includes amphibious animals with the exception of frogs.
In addition to the prohibitions mentioned in the Quran, most scholars traditionally extend the prohibition to carnivorous animals and birds, to vermin (rats, snakes, scorpions, cockroaches) and to donkeys and mules, and some also to elephants. It may be mentioned that certain insects, notably locusts and related grasshoppers are permitted. Honey is prized as a health promoting food.

**Factor 3**

**Food safety issues within Islamic ethics**

The food safety issues have given rise to debates within Islamic ethics and the question of consistency with Islamic sources. There are clear indicators that the contemporary Halal meat production systems in Muslim majority countries and in the West only emphasize the Islamic implementation of the technicalities of slaughtering. Yet respecting the lives of animals and their dignity appears to have been forgotten by Islamic production companies and Muslim majority governments. Islamic jurisprudence specifies which foods are halal ("lawful") and which are harām ("unlawful"). This is derived from commandments found in the Qur'an, the holy book of Islam, as well as the Hadith and Sunnah — libraries cataloging things the Prophet Muhammad is reported to have said and done (Standardisation for Halal Food, vol 11, no.4)

**Issue 1**

According to the Quran, the only foods explicitly forbidden are meat from animals that die of themselves, blood, the meat of swine (porcine animals, pigs), and animals dedicated to other than Allah (either undedicated or dedicated to idols), but a person is not guilty of sin in a situation where the lack of any alternative creates an undesired necessity to consume that which is otherwise unlawful. (Quran 2:173) This is the “law of necessity” in Islamic jurisprudence. In Islam there is a prescribed method of ritual animal slaughter; it does not apply to most aquatic animals. The animal must be slaughtered by a Muslim or by one of the People of the Book, generally speaking, a Christian or a Jew, while mentioning the name of God (Allah in Arabic). According to some fatwas, the animal must be slaughtered specifically by a Muslim; however, other fatwas dispute this, ruling that, according to verse 5:5 of the Qur'an, an animal properly slaughtered by People of the Book is halal. Although kosher meat or Jewish meat is slaughtered the same way, but Muslims cannot eat kosher meat because it's not blessed by a Muslim so is still considered haram. Other relevant verses in Qur'an include 5:3, 5:5, 5:90, 6:118, 6:145, and 16:115. According to Islamic faith, the animal destined for slaughter, must be killed quickly with a sharpened blade. It must not suffer. It must not see the blade. It must not see or smell the blood from a previous slaughter. Animals for food may not be killed by being stunned or electrocuted, and the carcass should be hung upside down for long enough to be blood-free. All water game is considered halal (although the Hanafi madhhab differs on this): “Lawful to you is game from the sea and its food as provision for you”. There are generally no restrictions on the consumption of vegetarian food as the restrictions pertain to slaughter.

**Issue 2**

Forbidden to you is that which dies of itself, and blood, and flesh of swine, and that on which any other name than that of Allah has been invoked, and the strangled (animal) and that beaten to death, and that killed by a fall and that killed by being smitten with the horn, and that which wild beasts have eaten, except what you slaughter, and what is sacrificed on stones set up (for idols) and that you divide by the arrows; that is a transgression. This day have those who disbelieve despaired of your religion, so fear them not, and fear Me. This day have I perfected for you your religion and completed My favor on you and chosen for you Islam as a religion; but whoever is compelled by hunger, not inclining willfully to sin, then surely Allah is Forgiving Merciful—(Quran, Surah 5,al-Maidah, ayah 3). Consumption of pork and products made from pork is strictly forbidden in Islam.

**Issue 3**

Most observant Muslims refrain from consuming food products that contain pure vanilla extract or soy sauce if these food products contain alcohol; there is some debate about whether the prohibition extends to dishes in which the alcohol would be cooked off or if it would be practically impossible to consume enough of the food to become intoxicated. However, it is believed that the use of alcohol has always been forbidden and refer to this Qur'an Ayah (4:43) as feeling of sleepiness and not to be awake.
Issue 4

Substances which are intoxicants are not prohibited as it is. For example, alcohol can be used as a disinfectant or for cleaning, but not as a beverage. Blood and its by-products are forbidden in Islam, in the Quran, surah 5, al-Maidah, verse 3.

Issue 5

New innovations in biotechnology, such as genetically modified crops, have opened a new horizon and brought ethics to the forefront of food debates. Genetic engineering is the process of transferring genes from one plant or animal to another. Through this new technique, vegetables can be grown and processed more efficiently. Genetically modified food possesses benefits such as herbicide tolerance, pest and disease resistance, cold tolerance and drought - and salinity tolerance. In the US and Argentina GM food has been welcomed by the farming community and it did not meet significant rejection by consumers. However, especially Genetic engineering is a quite recent innovation in biotechnology and the precise effects on human health are still contested; hence debates discussing the legalization of genetically modified food continue in both Western and Muslim majority countries. The demand for organic food is rising especially in Western countries. People want to eat healthy foods and hence dislike the consumption of food produced by using chemicals and pesticides. The preference to eat only organic meat and only that from species-appropriate husbandry is also rising amongst consumers. Muslims give due importance to the Quran and Sunnah with respect to all food safety issues while consuming foods coming from varied sources.

Islamic approach to food safety issues

Muslims are given all natural resources, personal goods and graces from Allah such that Muslims should work for their subsistence and sustenance to sustain in this world (to live, grow and be healthy) and in the hereafter to use it wisely, think about the creation of food in search for its development, and thank and how they used them to do righteous and benefic deeds (Qura'n, 28:77; 11:7; 11:61; 67:2; 94:4; 44:60; 39:18; 24:38; 16:90; 62:10; 10:26; 21:34; 7:168). Food safety is becoming a major worldwide problem. Almost one-fifth of the world’s population is Muslim. Consequently, food security management in Islam should be well thought out, institutionalized, checked for implementation, and fully implemented and maintained. It has been found that the Qura’n contains all the required management particulars, rules and aspects of people’s lives and all related activities, as well as all that is needed to understand these particulars and rules to derive the needed management framework suited for them over time and space (Haddad, 2012). The following Diagram (Fig 2) illustrates the Islamic Approach to food safety issues management.

Fig. 2 - Islamic Approach to food safety issues.
Halal products are fast gaining worldwide recognition as a new benchmark for safety and quality assurance. Products that are produced with Halal certification are readily acceptable by Muslim consumers as well as consumers from other religions. This acceptance is due to the wholesomeness concept of halal, which covers not only the Shariah requirement, but also the hygiene, sanitation and safety aspects. The wholesomeness concept of Halal food covers the lawful requirements of the Shariah law (law of Islam) and the requirements for good food, in terms of hygiene, sanitation and safety. To achieve the wholesomeness concept, both aspects need to be adhered to and implemented together. Failure in any of it will cripple the wholesomeness concept of Halal food. The standard emphasizes the sources of Halal food, which includes animals (land and aquatic), plants, mushrooms, microorganisms, natural minerals, chemicals and drinks. The requirement of genetically modified food is also covered in the standard. Besides, the standard also emphasizes that the food is safe and not poisonous, intoxicating and hazardous to health. The standard should also lay out the slaughtering requirements for the poultry and ruminant animals. The standard makes compulsory to physically separate Halal from non-Halal production, preparation and handling activities. The separation is also applicable to the storage activities where halal products are to be labeled to avoid being mixed with non-Halal products.

Safe food is food that does not cause harm to the consumers when it is prepared and / or eaten according to its intended use. In order to assure the food is safe, the food producers should take necessary steps to comply with Good Manufacturing Practice (GMP) and Good Hygiene Practice (GHP). Good Manufacturing Practice is where the producers apply the combination of manufacturing and quality control procedures to ensure the products are consistently manufactured to their specifications (Rahman and Kabir 2012; Rahman and Rahman, 2012). These principles are internationally recognized and the guidelines can be used together with other specific and appropriate codes of hygienic practice. There are several key principles that are critical to assure food hygiene. The combination of HACCP and Halal ensures the food is not only safe but halal. This combination is a powerful marketing tool for both the Muslim and non-Muslim food industries, as there are an increasing awareness of Muslims all over the world on their obligation to consume halal food. This trend of increasing demand for halal foods is expected to continue in parallel with an increasing Muslim population. Furthermore the Islamic awareness of halal food is expanding worldwide especially in the non-Muslim countries. Of late, the halal market surged with the global increasing awareness of the importance of food safety after the recent outbreak of global BSE food contamination in Europe and the new Commonwealth Independent States, where the populations are majority Muslims. The market for halal food products may come from Muslims and non-Muslim countries. It is estimated that the average global halal food trade is around USD$ 150 billion per year. In order to capture this enormous market of halal and Implementing HACCP and Halal Systems is the next logical step for food industries. A HACCP system ensures that the product is safe whilst the halal system ensures that the food can be consumed by anyone including non-Muslims. Both systems require hygiene and sanitation to be implemented. "Preparation, Handling and Storage of Halal Food" prescribes the practical guidelines for the food industry on the preparation and handling of halal food and serve as a basic requirement for food product and food trade or business (Standardisation for Halal Food, vol.11, no. 4).

Compliance to halal requirements

The halal food issue is a delicate, sensitive and serious matter to the Muslims. Halal Certification tells Muslims that the ingredients and production methods of a product have been tested and declared permissible by a certification body. It not only will help boost the confidence of the Muslim consumers that the food and product they purchase are not only halal but also hygienic. This also allows companies to export products to most Middle Eastern countries and South East Asian Countries. Ensuring a product halal is limited to the materials and ingredients used. Halal requirements cover all aspects of preparation, processing, packaging, distribution and all related processes. Any equipment found to be in contact or contaminated with non halal materials must be cleansed according to the Syariah requirements. In Halal food, cleanliness and hygiene is very closely related to food safety. This is an important prerequisite halal certification and the requirement covers personal hygiene, attire, equipment and working environment. With the certification, manufacturers are obliged to act responsibly to maintain the halal status of the food they produce. Manufacturers must ensure during all phases of the production, the raw materials, equipment, tools and materials used must not be najis, mixed with any najis
material or has been in contact with najis materials. The product and raw materials used must also be safe and will not cause harm to the health.

Benefits of halal certification (Standardisation for Halal Food, vol 11, no 2)

Halal food certification refers to the examination of food processes in its preparation, slaughtering, cleaning, processing, handling, disinfecting, storing, transportation and management practices. The application of halal should apply to all stages of processing “from farm to table”. Halal certification provides the following benefits:

Consumer confidence - it allows the consumers to make an informed choice of their purchase

Competitive advantage – manufacturers can use it as a marketing tool to secure bigger market share as halal food is suitable for both Muslims and non-Muslims. At international level, it can enhance the marketability of the products especially in Muslim countries.

Quality - it indicates that the food product not only fulfills halal requirements, but also strict hygiene practices.

For the authority - it provides a mechanism to audit and monitor halal food. The halal certification process is shown in figure 3 below
Humane considerations in Islamic rule

1. Halal slaughter (Rahman, 2007)

Islamic rules lay particular emphasis on ‘humane treatment’ of animals before and during slaughter and require that the process of immolation be as painless as possible. The incision of large blood vessels of the neck with a sharp knife causes anemia of the brain of the animal and sudden fall in the pressure of the spinal fluid in a few seconds. Thus the animal is rapidly rendered unconscious and is unable to feel any pain.
2. Pre-slaughter stunning

Many industrial countries with substantial Muslim minorities among their population have their legislations so enacted in which it is obligatory to stun animals before slaughter. Some of these countries export such meat of animals to Muslim countries. The use of pre-slaughter stunning in the light of Islamic concepts distinctly state that stunning with carbon dioxide and with bolt-shot pistol is unacceptable especially for sheep. It seems that these methods are cruel and inhumane. The meat of animals stunned with a bolt shot pistol would however be lawfully permitted if the animal is slaughtered while it is still alive. On the other hand pre-slaughter stunning by electric shock, if proven to lessen the animal's suffering, is lawful, provided that it is carried out with the weakest electric current that directly renders the animal unconscious and that it is neither leads to the animal's death nor renders is harmful to consumers. Electric stunning method is non-fatal and rapidly induces unconsciousness during which the animal could be slaughtered painlessly. There is no evidence of untoward changes in the meat which affect the consumer. On the basis of the fact that the electric shock used as therapy for certain mental illnesses in man is not particularly painful, therefore the electric stunning method will become generally acceptable as pre-slaughter stunning in Islamic countries. In spite of this acceptance it is important to note that poultry could in certain cases experience cardiac arrest when stunned by this method.

3. Experimental evidences of humane method of slaughter

Many allegations have been made that Islamic slaughter is not humane to animals. However, Professor Schultz and his colleague Dr. Hakim of the Hanover University, Germany, proved through an experiment, using an Electro encephalograph (EEG) and Electro Cardiogram (ECG) that Islamic slaughter is the humane method of slaughter and captive bolt stunning practiced by the western method, causes severe pain to the animal (Schulze et al, 1978 and Sahib Mustaqim Bleher, www. Mustaqim.co.uk). The results surprised many.

Experimental details

1. Several electrodes were surgically implanted at various points of the skull of all animals, touching the surface of the brain.
2. The animals were allowed to recover for several weeks.
3. Some animals were slaughtered by making a swift, deep incision with a sharp knife on the neck cutting the jugular veins and carotid arteries of both sides; as also the trachea and oesophagus - Halal Method.
4. Some animals were stunned using a captive bolt pistol - humane slaughter by the western method.
5. During the experiment, EEG and ECG were recorded on all animals to record the condition of the brain and heart during the course of slaughter and stunning

Results and discussion

I. Halal Method

1. The first three seconds from the time of Islamic slaughter as recorded on the EEG did not show any change from the graph before slaughter, thus indicating that the animal did not feel any pain during or immediately after the incision.
2. For the following 3 seconds, the EEG recorded a condition of deep sleep - unconsciousness. This is due to a large quantity of blood gushing out from the body.
3. After the above mentioned 6 seconds, the EEG recorded zero level, showing no feeling of pain at all.
4. As the brain message (EEG) dropped to zero level, the heart was still pounding and the body convulsing vigorously (a reflex action of the spinal cord) driving maximum blood from the body: resulting in hygienic meat for the consumer.

II. Western method by C.B.P. stunning

1. The animals were apparently unconscious soon after stunning.
2. EEG showed severe pain immediately after stunning.
(3) The hearts of the animal stunned by C.B.P. stopped beating earlier as compared to those of the animals slaughtered according to the Halal method resulting in the retention of more blood in the meat. This in turn is unhygienic for the consumer.

**Food safety issue problems in non-Muslim countries**

During the last few decades important dietary changes have occurred among population of the globe. Many new food items have appeared in the marketing channel. Developments in novel food technology, trade barrier relaxation and easy travel have created new situations which dictate requirements for reexamination of rules governing foods. In traditional Islamic societies, the rules governing foods have been reviewed and reexamined many times during the last centuries. These reexaminations are noticed in books and other publications on Islamic Jurisprudence (Fiqh) practiced in different countries at different times (Standardisation for Halal Food vol 11, no.4 and Wikipedia., Islamic dietary laws - Healthy diet, and Food and cooking hygiene, en.wikipedia.org/wiki/Islamic_dietary_laws). The most important problems which have arisen due to the aforesaid changes are identified and pinpointed below:

- Millions of Muslims are traveling and settling to non-Muslim industrialized countries in quest of labor or work and are living among communities with dissimilar dietary habits.
- Some Muslim countries are importing raw, prepared semi-processed foodstuffs from international sources often stocked from non-Muslim countries.
- Rapid advance in food technology and introduction of novel technology in industrialized countries have emerged religious problem because of using raw material which may include item prohibited in food ethics and Fiqh.
- Difficulty for the Muslim consumers to select foods in western markets which would be free from ingredients derived from prohibited substances.
- There is also difficulty to the import of meats and other food products from non-muslim countries.
- The ethical standards of traders and exporters have been found to be variable especially when they know that the truth of their declarations cannot be verified by presently available laboratory methods.
- Some airlines put a slip in their meal trays indicating that the meal is free from pork. This declaration may only mean that there is no pig meat in the dish but it does not always mean that the gelatin, emulsifiers, edible fats, stabilizers and other ingredients used in food preparation did not originate from pig tissues, blood and other prohibited products.

Rules concerning halal food are relatively difficult to adhere to non-Muslim countries. The abundance of pork and non-dhabīh meat (that is, from animals that are not slaughtered by the prescribed method) at restaurants presents a rather enormous problem to overcome. While an observant Muslim would not order a non-halal dish, there is a likelihood of concern about cross-contamination. This occurs when the halal dish is prepared with the same cooking tools and in the same kitchen as other non-halal dishes. Food particles and juices from the two dishes have the chances to get knowingly or unknowingly exchanged, thus technically rendering the dhabīh halal dish as haram.

Muslims, recognized in their faith and fidelity in Islam religion, share a majority proportion in more than 1.8 billions of the world population. Because of the recent rise in Muslim populations in the United States and Europe, certain organizations have emerged that certify that food products and ingredients meet Halal standards. The Muslim Consumer Group has come up and an organization that employs certification labeling, are using the H-MCG symbol, with a view to identify the status of different edible and non-edible consumer products. As Halal (H) certification gives evidences to Muslims that the ingredients and production methods of a product have been examined and tested and declared permissible by a certification body. It also gives authentication and permits companies to export products to most Middle Eastern and South East Asian countries. Since 1991, the mainstream manufacturers of different food products such as dry foods, soups, ready to eat foods, grains, cosmetics, enhancers, pharmaceuticals, prepared foods, and other industries, as well as hotels, restaurants, airlines, hospitals and other service providers are now pursuing the halal market and thriving to obtain halal certification. The oldest and most well known halal certifier in the USA is Islamic Services of America. In Europe, several organizations have been created over the past twenty years in order to certify the halal products (Muslim Consumer Group, en.wikipedia.org/wiki/Muslim_Consumer_Group). In 1986, the Islamic Meat & Poultry Company was founded in Stockton, California. This Islamic Meat and Poultry is a halal-only, U.S. Department of Agriculture-inspected, hand-
Halal Food Products in U.S. and Canadian Supermarkets

slaughtering and meat processing facility. This company follows the principles of slaughtering and meat processing according to the Islamic Shariah.

The halal market is now estimated to be 16% of world trade and is growing. Companies from Europe and North America that would like to access the growing halal market must get their consumable products Halal certified. The Global Halal Institute has a list of Halal certifiers that are approved by most Muslim countries with dietary import restrictions. Since the turn of the 21st century, there have been efforts to create organizations such as the Muslim Consumer Group that certify food products as halal for Muslim consumers in the USA (Muslim Consumer Group, en.wikipedia.org/wiki/Muslim_Consumer_Group).

Many apparently meat-free dishes, and even some desserts, contain pork, such as most kinds of gelatin, or other non-conforming substances. There is some disagreement about food additives such as monosodium glutamate (MSG) that may use enzymes derived from pig fat in the production process. It is difficult to avoid such additives when eating out since they are usually not listed on restaurant menus. Some Muslim organizations compile tables of such additives. Alcoholic beverages, including wine and whiskey, are used in many sauces and cakes, and alcohol is used as an ingredient (a solvent and a preservative) for the production and storage of food flavorings such as vanilla and other extracts.

It is evidenced from the internet news circulation that in 2011, the Halal Products Certification Institute was established in California and became the first worldwide corporation that certified halal consumer products such as cosmetics, personal care products, and perfumes and fragrances. The institute was established by Islamic intellectual scholars and Muslim scientists to assure the dissemination of halal consumer products. Also in Europe, several organizations have been created over the past 25 years in order to certify halal products. The controls implemented by individual agencies are all very different. In South Africa, most chicken products have a halal stamp. The South African National Halal Authority licenses the usage of the Halal logo in restaurants where the food is halal in addition to no alcohol or pork products being served.

MCG first launched its website in 2000 to aware and educate Muslims throughout the world about the Halal status of food ingredients. E-numbers and food products. MCG has written a book, titled A Comprehensive List of Halal Food Products in U.S. and Canadian Supermarkets that lists food products and ingredients that are certified as Halal (Wikipedia, en.wikipedia.org/wiki/Islamic_dietary_laws). One of the first halal food companies in the USA is Midamar Corporation, established in 1974. In Cedar Rapids, Iowa. It is also one of the first companies in the USA to sell USDA approved and halal-certified US protein products to the Middle East and South East Asia. The certification agency Islamic Services of America (ISA) was established in 2004 and is located in Cedar Rapids, Iowa. Islamic Services of America certifications are recognized by some Islamic countries. Information obtained from the internet revealed present situation reports and status of Halal food products. The scenario in the USA and Europe is worth mentioning. In Dearborn, Michigan, the home of one of the largest Muslim and Arab populations in the United States, some fast-food restaurant chains such as the McDonald's Corporation have introduced halal chicken nuggets and chicken sandwiches. Also, in New York City there are numerous halal food carts in business which serve gyros, chicken platters, and other halal fast foods, whereas in Europe, there are many Muslim-owned dönerkebab shops. A law passed by a county in Michigan in 2005 bans the sale, distribution, or production of food mislabeled "halal," when county authorities determine that the food does not meet Islamic dietary standards. Similar laws protect kosher foods in most of the United States, and in many other countries, states, or provinces.

In the United Kingdom, China, Malaysia, or Singapore, halal fried chicken restaurants having thousands of outlets serve halal foods such as the ChickKing Fried Chicken, Kentucky Fried Chicken, Brown's Chicken, and Crown Fried Chicken companies. As of February 2009, Kentucky Fried Chicken restaurants in the U.K. began to sell halal meals in several restaurants. Halal certificate is issued by a German registered merchant. Australian halal certificate is also given for certain foods.

Thailand and the Philippines also have a noticeable population of Muslims and halal-meat shops countrywide. Halal Science Center, Chulalongkorn University, Thailand, the first dedicated Halal Science institution in the world is an instructional center and network of laboratories in Thailand dedicated to maintaining the standards of Halal. It is the primary network dedicated to Halal science in Thailand. The Halal Science Center analyzes food for contaminants not compatible with the law of Islam and conducts research into new methods of food preparation and new reagents for detecting such contaminants.

Within the People's Republic of China, which has a sizable Hui Muslim minority population, halal food is known as qīngzhēn (qingzhēn; literally "pure truth"). Halal restaurants run by Hui Chinese resemble typical Chinese
food, except that they do not serve pork. Dishes specific to Hui Chinese are known as Chinese Islamic cuisine. A halal meat store was established in Hankou, China in ca. 1935. A halal Chinese restaurant is running in Da’an, Taipei.

**Practice of Islamic rules in identification and avoidance of foods with prohibited ingredients**

The Islamic rules recommend identifying and avoiding foods with prohibited ingredients. Today in non-Muslim countries it will be seen that even apparently vegetable or milk products like bread, pastries, biscuits, chocolates, ice cream, cheeses, and margarine, may contain prohibited components. Sausages, corned beef, soups and other similar foods also contain these ingredients, but in the label these are not clearly indicated. The food laws in many countries state that food labels should indicate the main components, but the actual practice of labeling does not take Islamic rules into consideration. For example, components declared as ‘animal fat’, ‘edible fat’, and gelatin, ‘emulsifier’ may have been derived from prohibited raw materials. Many food products such as breads and other bakery products may not carry composition labels at all. It is therefore virtually impossible for the Muslim consumers to be sure that the apparently permitted food items offered in shops are really free from prohibited ingredients.

The components of mixed, raw or partly processed foods of animal origin can often be identified (as to the animal species for which they are derived) by anatomical, chemical, microscopic, and immunological examinations of blood, flesh, fat, hair and bones. Use of DNA technology and other advances of the last few decades have made it more and more reliable but these practices unfortunately have restrictions. Modern processing of foods currently market use of complex and sophisticated methods of physical and chemical treatment which alter the raw materials beyond recognition even by laboratory analysis. Moreover, some apparently primary ingredients may also been subjected to processing which may have used religiously prohibited material. For example, cooking oil labeled as “pure vegetable oil” may have been treated with stearates or diglycerides derived from swine flesh.

There are several 'functional' and other materials used by the food industry, which could be derived from prohibited swine tissues or shed blood or permitted sources from ruminants and plant sources. Under Western food laws, it is not obligatory to declare the exact origin (plant or animal) of these substances on food labels. Some of these materials that are used in foods are presented below:

- **Gelatin and other thickening materials:** Edible gelatin is cooked collagen and is derived from bones and skin parings of slaughtered animals (cattle, pigs and others). Often the materials from different animals are not processed separately and may be imported from abroad, thus making their origin even more obscure. Gelatin is widely used for preparing soups, meats, pastries, ice creams etc. Alternative thickening and firming materials of vegetable origin such as pectin, agar and alginate would be of course be acceptable along with gelatin from permitted animals.

- **Rennin and pepsin:** These are used as milk coagulants for preparing cheese and may be obtained from calf or pig stomachs. The source of these enzymes is identifiable only if the manufacturer declares it. Acids formed by bacteria are widely used for curdling and cheese making. These are quite acceptable.

- **Emulsifiers such as mono- and diglycerides, polysorbates and monostearates** may be derived from plant or animal (pig, cattle) sources.

- **Animal fats, notably lard, or their derivatives** are widely used in preparing a variety of otherwise acceptable foods such as bread, dough, cakes, pastries, and biscuits, poultry and calf sausages, soups and sauces chocolates, margarines and may other foodstuffs. Some of these foods may also contain other ingredients of animal origin such as cysteine and emulsifiers. Animal fats are also used for deep frying or simply as pan grease in roasting.

- **Blood used in blood sausages** is readily identifiable but plasma and some other derivatives which are widely used in many food items are not so readily perceived by the consumer.

- **Alcohol** is detectable by the consumer when strong liquors are used as filling in sweets or added to drinks but not easily perceptible if used as “flavor” in small quantities in desserts and other foods.

**Concluding remarks**

The Islamic Rules governing food shows that they are simple and clear and can be applied easily in Muslim countries. The standard makes compulsory the requirement to physically separate Halal from non-halal production.
and preparation. Hygiene, sanitation and safety are important factors in manufacturing and preparing food. It is clearly mentioned in the standard that these factors are pre-requisites in preparing Halal food which also emphasize that the food is safe and not hazardous. Thus Good manufacturing (GMP) or Good Hygienic Practice (GHP) is a compulsory requirement in preparing Halal food. Meanwhile the implementation of food system, where the Hazard Analysis Critical Control Point (HACCP) is the recommended system, is on voluntary basis permitted. Some problems are however created by developments in food industries in the western Diaspora where millions of Muslims are now residing. The food industry is an evergreen industry and halal food is the latest trend in the world market. Customers demand for halal food is increasing not only in the Islamic countries but also in Europe and America. Demand for halal food is estimated at US$150 billion a year with the increase in world Muslim population to an estimated 2 billion people. The industries make frequent use of prohibited raw materials or their derivatives which are not necessarily mentioned on food labels. Some approaches laid below have been proposed to meet the difficult situation in the western Diaspora.

✓ The food industries may be induced or obliged by law to take Muslim food rules into consideration in labeling their products. This approach is likely to cover mostly the foods meant to be exported to Muslim countries.
✓ Where Muslims are living in sufficient numbers, they should start their own food industries and shops. Although this is being done in some industrial countries but covers the needs of the community and region only partially.
✓ Muslim associations all over the world assisted by scientists should publish lists of brands or marks of foods using permitted items. As stated above, this is being done by the Islamic Food and Nutrition Council of America.
✓ The householders may use only primary materials to prepare their meals. However, some materials like vegetable cooking oils may have been subjected to unacceptable processing unknown to the house holder.

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