



Halal Foods Awareness and Future Challenges

Imran Aslan^{1*} and Hakiye Aslan²

¹Business Administration, Department of Occupational Health and Safety, Bingöl University, Turkey.

²Faculty of Engineering-Architecture, Department of Food Engineering, Bingöl University, Turkey.

Authors' contributions

This work was carried out in collaboration between both authors. Author IA made substantial contribution to the conception and design, acquisition, analysis and interpretation of data. Author HA helped for content determination and the importance of study in food industry. Both authors reviewed and approved the final manuscript.

Article Information

DOI: 10.9734/BJEMT/2016/23861

Editor(s):

(1) Kamarulzaman Ab. Aziz, Deputy Dean of R&D, Faculty of Management, Multimedia University, Persiaran Multimedia, Malaysia.

(2) John M. Polimeni, Associate Professor of Economics, Albany College of Pharmacy & Health Sciences, New York, USA.

Reviewers:

(1) Anonymous, National Research Center, Cairo, Egypt.

(2) Yin Zhang, Chengdu University, Chengdu, China.

Complete Peer review History: <http://sciencedomain.org/review-history/13371>

Original Research Article

Received 25th December 2015

Accepted 1st February 2016

Published 20th February 2016

ABSTRACT

Halal food concept was simply defined few years ago by Muslim scholars with banning some foods. However, pesticide products and Genetically Modified Foods (GMO) bring new discussions among Muslim countries and Non-Muslim countries. Some countries responsible from halal certifying approach this concept differently. In this study, approaches to halal around the World and in Turkey are explained with some studies done before and getting the opinions of experts worked in halal field. In the World, there is not a common halal standard and each country tries to develop its halal standards. These standards change from country to country even all certificates are referenced to Holy Koran. Turkey is one of the main food exporters to Iraq Kurdistan. Thus, to learn the awareness of people living in Erbil city, 500 surveys were applied at Shaqlawe Technical Institute and Technical Administrative Institutes in Iraq Kurdistan. Descriptive statistics, ANOVA and correlations methods are used to analyze data. It is found that there is not enough awareness in Erbil city even though it is a Muslim city in majority. New production methods and additives to foods are challenges both religiously and scientifically. Moreover, GMO and other pesticidized food-medicated foods have not been clearly stated whether they are halal or not in Many Muslim countries.

*Corresponding author: E-mail: iaslan@bingol.edu.tr, imranaslan@gmail.com;

Keywords: Halal awareness; Halal Logo; certification; Turkey; Arbil; GMOs; organic farming; pesticides.

1. INTRODUCTION

The World population has been increasing and it is estimated that it will be about 12 billion in 2050 (Wiki [1]). Thus, people worry about that foods will not be enough for human beings and there is a need of two times foods for the doubled population. Moreover, the religions as Islam, Christianity and Judaism play a major role in the life of many people. They obey the rules dictated them by God as a part of their life. Muslims people are restricted according to Holy Koran book of Muslim. Many scientific people try to find solutions by changing the genetic of foods to create more efficient and durable foods named as Genetically Modified Foods (GMO) and to get more profit. Also, many foods are medicate to get more crops and there are no apparent rules whether they are haram or permissible. Nevertheless, organic foods can get more crops in the long run than changed foods It is stated by Boyraz [2], medicated foods are dangerous for human body and there are no strict controls in Turkey to define them. Foods forbidden by religion such as pigs, alcohol etc. and foods dangerous for human body are not permissible to eat from Holay Koran (Si [3]). However, there are great dilemmas about GMO and pesticides foods consumed recent 15 years and pesticides penetrated into foods. GIMDES the oldest and main halal certificate givers does not give any halal certificate to GMO foods in Turkey but not stating that they are haram. The DNA of pigs can be used to change the DNA of foods and animals. Halal India Manager Mohamed Jinna [4] stated that GMOs are haram and Mohamed El-Mouelhy chairman of Helal certifications in Australia stated that GMOs can be halal while they can bring more beneficial results for humans like the production of cheese. Nevertheless, he is against of DNA coming from pigs or products (ransgenic materials from pork or other "harem" or "mashbooh" products). According to the Islamic Jurisprudence Council (IJC), Islamic Food and Nutrition Council of America (IFANCA) and kosher standards, the GMOs are halal (Hazzah [5]).

Turkey is the main exporter of foods to Iraq Kurdistan. This region cannot meet its food needs of all citizens but has huge amount of oil with Kerkuk. Last ten years after the fall of Saddam Huseyin a dictator in Irak before 2002, the region has turned its face to Turkey and

increased all relationships (Üstün [6]). Being close to Turkey, similar culture, being Muslim and having long history with each other have made Turkey and this region close friends. With its increasing oil exportation and stability, it can be a hub for Turkish exporters. Thus, obeying the rules of Halal and trust to Turkish exporter are very critical factors for these exporters to get more market share there. Turkey has a great potential of food producing in its fruitful and large soil. There are two main certificate providers: Turkish Standard Institute (TSE) and GIMDES civil organization to increase halal awareness in Turkey. TSE provides this certificate due to the increasing awareness of people in other Muslim countries doing import from Turkey and with help of media like social media. GIMDES [7] provides certificates based on a long procedure and regular controls. However, there is a paradox for both organization by not having a defined system and standards as stated by Özer [8]. He stated that both organizations give certificates according to economical benefits but not based on real lab and observations as done for ISO certificates but used as an advertisement tool to attract more customers. Both organizations provide the list of firms getting halal certificate in Turkey. Firms need to pay 600-1500 \$ to get halal certificate from GIMDES and TSE provides a more expensive and different procedure based on the types of products and services sated in TSE1 [9]. Moreover, there are three less popular firms named as World Halal Community, Helalder and HEDEM giving halal certificates in Turkey. As the comments from social media (SM) are read, the main problems are the trust and whether they do regular checking for the validity of certificates (HP [10]). GIMDES cancels the certificates not obeying rules and giving haram products by publishing them on web page with its reason and TSE punish firms with some monetary payments and cancels their certificates. Moreover, another problem met in SM is that there are some differences according to sects of Islam named as Hanafi, Shafi'i, Maliki and Hanbali for Snails, frogs, meat ofal, etc. products. Furthermore, Firms have to get halal certificate for each of their product and some firms may misuse the certificate for other products (TSE2 [11]).

In Turkey, GMOs products are forbidden to enter the country but, with below less than 0.9% GMO products can enter Turkish market named as

immersed GMO products. However, tons of GMOs products Like oil of soybean which is difficult to detect whether it is GMO product or not, meat, chicken, beats etc. due to not making effective controls country wide are illegally sold in Turkey according to food movement agency (GH [12]; Timeturk [13]) GMO products affecting badly immune system and urinary functions of human can resist external environment, are cheaper and can have a longer shelf life. There are just 40 labs of Turkish Accreditation Institute in Turkey and just 10 of them can find GDO products or genes and they are not allowed to check products sold worldwide. (Bal [14]) According to Kostak [15], Islamic conditions, legal requirements (health), documentation and audit are requirements of halal certificate. However, there are not any standards and regular auditing in Turkey and thus, many organizations giving certificates do this work for economical reasons such as earning money. Calibration requirements, training, processes, customer satisfaction, adequacy intermediates, internal audit, product validation, storage, critical control points, corrective and preventive actions and policies of Islamic quality are to be prepared for country wide certifications. Kostak [15] suggested that each certification should be valid for three years and firms not being able to pass standards should get certification money back but they should pay control costs and they should be able to apply at least six months later to fix their problems (Kostak [15]).

2. LITERATURE REVIEW

Islam the natural way of life is aim to preserve "the purity of religion, to safeguard the Islamic mentality, to preserve life, to safeguard property, to safeguard future generations, to maintain self-respect and integrity." (Dali et al. [16]) In the Quran which says "O ye people! Eat of what is on earth, Halal and toyyib; and do not follow the footsteps of the Evil One, for he is to you an avowed enemy" (Al-Baqarah, n.d [17]). Allah in the Holly Quran; "Forbidden to you (for food) are: Al-Maytatah (the dead animals-cattle-beast not slaughtered), blood, the flesh of swine...." (Holy Koran, verse3 [18]; Nakyinsige, Man and Sazili [19]) 16% of the entire global food industry is halal and it will increase more in the future. Muslim world living Asia, Africa and Europe with respectively 63%, 24%, and 10% of the global market represents 23.4% of an estimated 2010 world population of 6.9 billion. Development of halal standards, traceability systems, and halal science centers according to Halal dietary laws

have been developed with initiative of Asian countries-Malaysia, Indonesia, Thailand, Singapore (Spiegel et al. [20]). Foods required for nutrition, well being and physical fitness and meals are a part of cultural, social and religiousness. Islam is a way of life to be obeyed by its followers. Halal meaning allowed, lawful and permitted is used to consume foods according to Islamic Law. It represents some standards and processes but not just forbidden alcohol, or drugs also with safety, hygiene, reliability and quality assurance in an economic and scientific way. Increasing in the awareness towards the Halal concept can expand the current halal food market both nationally and internationally (Teng et al. [21]). The homogeneous products can be offered to the same market by different competitors. With the blue ocean strategy attracting many people from various background can be applied to halal food market having more than \$600-700 billion potential. Not just 1.6 billion increasing Muslim population with increase of 3% each year but also non-Muslims can be a target for this market with its strategic choice of differentiation and low cost. More awareness among Muslims for their responsibility to eat halal foods can increase the market size more (Dali et al. [16]; AAFC [22]).

The impacts of religious change from one culture or country to another (Alqudsi [23]). Ingredients, ownership and marketing-related factors of halal food product are focused more rather than on certified halal logo in Kelantan, Malaysia (Omer et al. [24]) Halal accreditation meeting the standards of ISO9000, Good Hygienic Practice (GHP), Good Manufacturing Practices (GMP), veterinary inspection, Codex Alimentations and Hazard Analysis and Critical Control Point (HACCP) is used for food safety, quality assurance and many beneficial characteristics by not just Muslim consumers having bought any halal labelled food with 56.8% and bought always with 6.2% in Malaysia but all consumers to provide healthy foods according Islamic rules with high quality. Better health, hygiene, safety, the environment, social justice and animal Welfare-healthier, safer and humane animal treatment matching with halal requirements are benefits of this accreditation, which can help to attract many non-Muslim consumers (Teng et al. [21]). Halal logos are be able to convince people to buy halal foods or services with promoting local halal products. 40% of the respondents from a survey in Penang-Malaysia stated that they will not buy any food without halal logo and 18% of them look actually to the halal logo while

buying. This rate is very low since Muslim people in a Muslim country think that all products and services are prepared in a halal way (Dali et al. [16]). Individual, social and environmental factors can increase the awareness of halal foods. Health-conscious market segments can be target for halal food accreditation besides Muslim consumers. Findings showed that non-Muslim consumers have a positive attitude for halal foods. The effects of Socio-demographic profiles are analyzed in the figure below by Teng et al. [21]. Health consciousness and perceived value factors were found to be the main factor affecting organic food consumption (Alqudsi [23]). All variables shown in Fig. 1 are analyzed in this study from survey done at Arbil city and their effects on towards Halal foods is explained.

303 self-administered questionnaires among British Muslims were surveyed to learn the effects of factors like religion or perceived value and perceived usefulness of a halal-labelled product on Intent to purchase. Vertical collectivism is the “stresses deference to authority figures and to in-group wishes” and horizontal collectivism emphasizing sociability was also investigated to find factors affecting intention to use halal foods with moderating reason of religion. British Muslims believe that firms manipulate information about foods. It is found that a halal-labelling strategy can get the heart of British Muslims with high level of satisfaction, commitment and loyalty. Moreover, British Muslim community trusts the words of mouth frequently opinion leaders and spokespersons. These factors can be used for marketing strategies of halal food industry. Perceived usefulness, vertical collectivism, horizontal collectivism and religiosity are main factors of model and perceived usefulness, vertical collectivism and religiosity have positive relationship with intention (Jamal and Sharifuddin [25]).

150 set of questionnaires were carried out at Klang Valley in Malaysia to learn the attitudes of Muslims against non-Muslim manufacturers by showing random sample of halal packed food products produced by Non-Muslim manufacturer. Many Muslims still refuse to buy Non-Muslims halal certified packaged food due to lack of trust. It was found that there is not any significant relationship between Islamic brand and Muslim's intention to purchase while halal awareness and product ingredients have relationship with buying intention (Yunusa [26]). The regulations on Indonesian people mainly consuming chicken

product halal product guarantee are legalized to provide halal needs. A survey to 292 respondents with 88% of Muslim respondents of three kinds of outlet-chicken in Wonogiri district in Yogyakarta was surveyed. In places where Muslims are in minority halal-haram food difference is more alerting. Moreover, taste (59%), being halal (27%), while variation, texture, and packaging only considered by 8%, 5%, and 1% respectively are factors affecting decision to buy products from that survey besides halal. Family (60%) and friends and co-workers (27%) are the most effective influencers to buy halal products (Ismoyowati [27]).

Improper use of halal certificates or labels create problems among Muslim countries in which a halal product can be Haram in another country (Spiegel et al. [20]). In East Asia, halal certification is mandatory for all meat and meat products with regular authentication of governments. PCR-based techniques for pork detection are used to amplify very few copies of DNA in order to determine the type of product whether halal or not. Moreover, Fourier transform infrared (FTIR) spectroscopy or an enzyme-linked immunosorbent assay (ELISA) and Pork detection kits developed recently in Japan can be used to detect pork related products (Nakyinsige, Man and Sazili [19]). Many ingredients like emulsions or aromas haram can be mixed with foods. Contamination with pork as gelatine, enzyme, glycerine, and lecithin or using in as fat as a substance of emulsifier E471 and E472 in many products like bread is major problem for Muslims. Moreover, animal welfare, the ritual slaughter method, treatment and separation of halal animals, cleaning and disinfection, separation of halal and haram food at all stages are major topics of the halal food supply chain. Laboratory analysis for haram ingredients and controls of halal production are used whether a food is halal or not. Mashbooh foods are suspected whether they are halal or not. There are no definite rules for genetically modified products. In Muslim countries like Malaysia and Indonesia, the halal labeled products have to be halal otherwise producers are punished. Certificates and labeling are to be taken by trustable organizations controlling them regularly at place and market (Spiegel et al. [20]). Lack of enforcement by the Department of Islamic Development and the lack of collaboration amongst the world's Halal certification authorities make big dilemmas among Muslim consumers (Dali et al. [16]). Direct contact with haram (prohibited), risk of contamination and perception

of the Muslim consumer direct contact with haram (prohibited), risk of contamination and perception of the Muslim consumer are facts affecting halal supply chain management. All products are to be transported, packaged and stored in suitable manner without touching any haram food and in clean manner according to Shariah standards available from MS 1900:2005: "Quality Management Systems-Requirements from Islamic Perspective in Malaysia" and MS 2400:2010: "Halalan-Toyyiban Assurance Pipeline standard" certified by Department of Islamic Development Malaysia (JAKIM) covering transportation, warehousing and retail of supply chain management of halal product with defined guidelines (Tieman and Ghazali [28]; DSM [29]). All steps of halal Supply Chain are controlled by JAKIM for sellers to obey rules and increase trust

in halal logo. Halal Industry Development Corporation (HDC) is created by Malaysia for Muslim countries. Falsifying halal certificate and selling non-Halal as Halal products are to be penalized by governments to protect right of costumers in all downstream and upstream activities (Zulfakar, Anuar and Ab Talib [30]; Khan [31]; Omar [32]) Critical Halal control points can be created to obey halal standards of a comprehensive and reliable traceability system to increase halal transparency and enforce the halal integrity. Radio Frequency Identification Device (RFID), barcode and Internet Technologies can be used instead of all existing tools unreliable, lack of security, not real time basis and take longer time (Zulfakar, Anuar and Ab Talib [30]). The examples of halal standards around the world shown below.

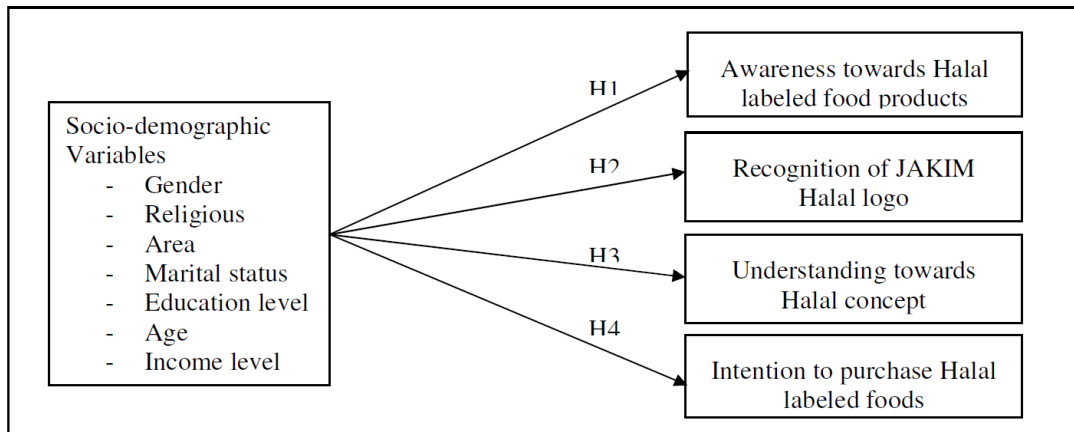


Fig. 1. Conceptual framework of non-Muslim Consumers Awareness, Recognition, Understanding and Intention towards Halal Labelled Foods (Teng et al. [21]).

Table 1. Examples of halal standards and guidelines worldwide (Spiegel et al. [20])

Level	Country	Organization	Standard/Guidelines
Global	All countries	CAC	CAC/GL 24-1997
	All countries	WHC	Unified halal food standards worldwide
Asia	57 Countries	OIC	ICRIC-MHS-0110
	All countries	CICOT	GHMS
	10 South East Asian Countries	ASEAN	ASEAN Halal Guidelines
	Thailand	CICOT	THS24000:2552
	Malaysia	JAKIM	MSI 500:2004
Persian Gulf Countries	Indonesia	LPPOM MUI	Guidelines-Assurance
	7 Persian Gulf Countries	GCC	GSO993:1998
	United Arab Emirates		GSO1931/2009 UAE993:1998
Europa	European Countries	CEN	Guidelines for Halal
	Austria	ASI	ONR14200:2009

Pork substitution, undeclared blood plasma, use of prohibited ingredients, pork intestine casings used due to being cheap and non-halal methods of slaughter named as sometimes dhabihah by draining of blood without pre-slaughter stunning are major steps to analyze meat and its products. Pork can be used to substitute expensive animal protein like the use of mechanically recovered meat such as meat pies, sausages and some burgers. Casings used to shape meat products can be made of pork intensities instead of cellulose casing and other halal methods. Sausage like "sucuk" can be made of meat from mutton, chicken or pork by mixing with salt, herbs and spices. Colorants, aromas, preservatives, flavour enhancers, binders, thickeners or stabilizers are added to meat products like gelatine (Nakyinsige, Man and Sazili [19]). In Northern Ireland, a food company was fined to £70,000 due to selling meat not halal with halal logo and falsely labelling beef products with including beef hearts to expected to be separated and labelled differently against EC regulations. This causes the damage of firm image among costumers (BBC [33]).

Perception about Muslims – Islam-phobia is another crucial obstacle for developing halal standards in many Non-Muslim countries (Saida et al. [34]). However, increasing globalization, multiculturalism and transnational cosmopolitanism force different cultures to co-live in many countries (Jamal and Sharifuddin [25]). "Les hamburgers halal de Quick passent mal" (Quick a fast-food restaurant Halal Burgers are Hard to Swallow) is the dilemma in France by supplying halal burger. Food and food habits are the parts of culture and identities and can arouse national identities, which can be named as Gastro-nationalism in French. Halal Quick's restaurants provided just halal burgers in France. It is found that halal burgers differentiate foods and people by...with searching publication in famous newspapers media claims in France. Just 41% of publications was in the support of halal burger. "Islamization of France," "Islamic tax," or "Islamic organizations," slogans are used as "collective paranoia" of Islam to hinder halal burgers, which is ideological themes undergirding defensive of gastro-nationalism (Wright and Annes [35]). Firstly Islam was introduced to Japan as a Western Religion in 1877 and then the naval vessel named as *Ertugrul* from Ottoman Emperor came Japan to introduce Muslims and Japanese people with each other in 1890. 55 *halal* food shops are available in Japan for Muslim citizens and tourists. Due to lack of knowledge and

awareness on halal food and being a sensitive issue of the religion, the halal concept was not developed in Japan until 2010. \$ 100 billion halal-friendly tourism and increasing number of Muslim students and decreasing power of Japan in Automobile industry force them to open Japan Halal Association (JHA) a non-profit organization and recognized by recognized by International Halal Alliance (IHI) and JAKIM (Yusofa and Shutto [36]). 740 participants of World Halal Forum 2011 and World Halal Research Forum 2011 were surveyed in Malaysia to learn whether academicians from different nationalities have different perception about Malaysia's products and specific Malaysia's Halal food products or not. 86% of survey people stated that they buy halal foods since it is mandatory even though 94% of the respondents are Muslim (Saida et al. [34]). According to Shahidan and Nor [37] inconsistency of animal slaughtering definition, the introduction of Halal logo by various bodies, the use of Arabic sounded or Islamic-signalled brand names, the rampant display of Quran verses and the lack of enforcement on the misused of Halal logo are major challenges for Halal Supply Chain (Shahidan and Nor [37]). *Toyyiban meaning* healthy, safe, nutritious, quality is another principle of Halal industry. segregation and proper handling for the halal meat products from the non-halal meat is to be developed. 200 Muslim participants (130 were from Singapore, 40 from Malaysia and 30 from Australia) from three countries namely Singapore, Malaysia and Australia for 100% meat were surveyed to learn their perceptions. It is found that there is the need of specialized halal compliant solutions for its supply chain and logistics process and Muslim consumers are ready to pay a premium for halal meat products with 100% halal supply chain as shown below with attributes (Alqudsi [23]).

Lucrative Halal market with non-Halal elements (emulsifier, gelatin, enzymes, glycerin and lecithin) is major field to be enlightened in Muslim countries (Shahidan and Nor [37]). Level of consciousness towards Halal cosmetic is 57% and 37% of Muslims in Singapore and Indonesia respectively. halal ingredients in cosmetic products are a serious problem for Muslim countries since non-Muslims are main producers of cosmetics sold at Muslim countries from discussions of 20 young urban Muslim female adults from the Klang Valley, Malaysia. When making decisions to buy cosmetics, ingredient product suitability, halal, and price are main factors affecting Malaysian

Muslim women. It was found that they have low awareness for halal cosmetics and 'Halal' is not a priority for them (Jihan, Hashim and Musa [38]).

To make correct choices for the common good, present and future, Francis Pap calls for "A broad, responsible scientific and social debate...one capable of considering all the available information and of calling things by their name" because "It sometimes happens that complete information is not put on the table; a selection is made on the basis of particular interests, be they politico-economic or ideological" (Godoy [39]). There is not certain conclusion for the use of pig genes in GMO processes in Islam according to GR1 [40] but saying to be careful about consumption of GMO from pig genes. There is no food security rules for GMO in Turkey to detect GMO foods (GR2

[41]). According to researches done around the world, about 70% of foods are with GMOs or derived from GMO products (GR3 [42]). The civil organization GIMDES does not give any halal certificate to GMOs (GIMDES [43]). A group of healthy pregnant women(n = 30) and a group of healthy fertile non-pregnant women(n = 39) in a study done in Quebec, Canada are compared to learn the effects of pesticides associated to genetically modified foods (PAGMF) by blood sampling by exposing them to GM foods in the local daily diet (soybeans, corn, potatoes, . . .). Herbicides such as glyphosate (GLYP) and gluphosinate (GLUF) or insecticides can harm human body while increasing the productivity of crops. Prenatal complications such as abortion, intrauterine growth restriction etc. and reproductive disorders like infertility, endometriosis and gynecological cancer can be due to foods consumed.

Table 2. Ranking of attributes when selecting Halal meat products (Alqudsi [23])

Attributes	Singapore Rank	%	Malaysia Rank	%	Australia Rank	%
Prices of Halal Meat Products	5	12.31	5	30	5	10
Display of Halal Logo and Certificate	1	67	1	60	2	43
Separate Storage	3	35	4	40	4	27
Observations and Controls	2	43	2	47,5	3	40
Cleanliness	4	30	2	47.5	1	56.67

Table 3. Frequency table of respondents

Questions	Options	Perc. (%)	Questions	Options	Perc.(%)
<i>Age</i>	20-30	73,8	<i>Hearing Halal Label</i>	Yes	73,4
	31-40	17,6		No	26,6
	41+	8,6	<i>Bought Halal Labeled</i>	Yes	83,0
<i>Gender</i>	Woman	44,6		No	17,0
	Man	55,4	<i>Source of Information</i>	Doctor / Nutritionists	36,0
<i>Social status</i>	Single	53,6		Parents	28,2
	Married	46,4		Friend	10,4
<i>Your Occupation</i>	Student	58,8		Government	15,2
	Employ	33,4		Relatives	5,2
	Teacher	7,8	Teacher /Lecturer	5,0	
<i>Do you have children</i>	Yes	34,6	<i>Education</i>	Secondary school	46,4
	No	65,4		Diploma	25,2
<i>Trust Res.Owner</i>	Yes	53,2		B.ch	23,8
	No	46,8	Higher Deg.	4,6	
<i>Looking Credentials</i>	Yes	52,6	<i>Experience</i>	1-3	60,6
	No	47,4		3-5	14,4
<i>Accepted Verification</i>	Verbal Assurance	29,0		5-10	16,0
	Formal Certification	65,8	10+	9,0	
	Online Opinion	5,2	<i>ImPersonal</i>	E-Advertisement	25,8
				Facebook / Twitter	74,2

Table 4. Mean of questions

Questions	Mean
Always(1)-Never(5)	
Do you look at the credentials of a meat distributor when determining if a restaurant is in fact halal	1,47
How often do you check the halal logo on food package	2,13
How often do you trust the halal logo on food products	2,45
How often do buy halal labelled food	2,16
From Strongly Disagree to strongly agree	
1-I put so much effort to find halal restaurant	3,17
2- I should be full sure that the restaurant has a halal status to eat there	3,72
3- It is important for me that the restaurant just order halal foods to eat there	3,78
4- It is important for me that food not come in contact with haram ingredients to eat there	3,80
5- The cleanliness of a restaurant must be high for me	4,03

Toxin in insect-resistant GM crops can be eliminated effectively in human body. 3-MPPA and Cry1Ab toxin detected in pregnant women, their fetuses and non-pregnant women can cross the placenta and harm foetus (Aris and Leblanc [44]). Some monetary supports done to some scientific in order to prove that a famous drink not causing obesity but due to lack of exercises while others sate that it cause obesity in reality. Moreover, some soft drinks make people addictive (Sullivan [45]).

3. MATERIALS AND METHODS

Studies done by Teng et al. [21] and Halal Hub [46] are used to prepare survey questions in order to learn the awareness of about 100% Muslim Arbil city by applying 500 surveys at Shaqlawe Technical Institute and Technical Administrative Institutes. Based on the study done and increasing awareness, the halal market is expanding and creates new opportunities. To analyze data, descriptive statistics, correlations and ANOVA tests were applied. The reliability 1-5 likert scale question is 0.73 greater than 0.7. Differences according to age, gender, income level, education, social status and occupation, the effect of each group are found and compared within each sub-group.

4. RESULTS OF QUESTIONNAIRE

According to Crosstabs results, 73.9% of respondents are between 20-30 ages and 93.3% of them does not have any children. 186 respondents from 369 respondents between 20-30 ages do not trust restaurant owner if they say that they sell halal products. Respondents greater than 30 years old trust more the verbal assurance of owners. Just 24 respondents stated that they never eat halal foods. 329 respondents state that formal certification is the

most trustable method to get acceptance. 133 respondents have not heard anything about halal foods.

According to Liker-Sclae (Never(1)-Allways(5)), respondents average eating halal foods is 4.74 and 425 of them stated that they eat always halal foods. The average income is 421,953.80 IRL among respondents.

20-30 age responders are more susceptible at trusting restaurant owner with sig. 0.018 that there are significant differences according to age group. Younger respondents check with more frequency than other age groups about credentials of a meat distributor. Respondents older than 30 years have more income level. The average of frequency eating halal foods is 4.74. Moreover, there are significant differences according to checking logo and trusting logo. Furthermore, buying halal labelled foods show also differences. Cleanliness of restaurants changes according to age group. 41+ age group put more effort to find a halal restaurant. 31-40 age group has more eagerness that restaurant sell just halal food. 20-30 respondents care less about the not having any contact with haram ingredients to eat there and for 31-40 age group, the cleanness is the most important factor in other groups.

Women show lower trust in restaurant owner and women earn 327,739.13 IQD and men earn 491,855.00 IQD monthly. Women stated that they eat halal foods with 4.84 mean close to always and this rate is 4.65 for men. Both genders have bought a halal labelled food in their life. Women check the halal logo more than men close to always. Both genders have mean of t 2.5 in trusting halal certification of sellers. They do not search for halal restaurants very much while they think that all restaurants are halal. For both

groups, the restaurant with just halal food ordering is important. The cleanliness of a restaurant is more important for women. Moreover, there are significant differences between both genders in trusting restaurant owner, frequency of eating halal, experience, social status, looking at the credentials of meat distributor, and checking halal logo with ANOVA sig. value less than 0.05 as shown in Table 5. According to occupation, students have lower trust to restaurant owner and all groups stated that they eat always halal food. Employes and teachers have heart more about halal labeled foods. Teachers look more at the credentials of a meat distributor while students have low level of trust to logo. Selling just halal foods is critically important for students while any contact to haram foods is not suggestible by employees. For three groups, the cleanliness of restaurant is important. Items having significant differences according to occupation are shown below. Changes to be done are taken into account the differences in order to increase the halal awareness. As the level of education as diploma, bachelor and higher level increases, more awareness is found among respondents. There are significant changes according to trust in restaurant owner, average income level, hearing halal labelled food, and the frequency of checking halal logo food packages according to ANOVA tests with 0.05 significance level.

There are 268 single and 232 married respondents. Single and married respondents with 47% trust to the restaurant owner telling that he sells halal foods. Single respondents have

lower trust in restaurant owners with 1.53 mean (Yes:1, No:2). Married respondents said that they eat always halal foods and this rate is also high for single ones. Married respondents showed higher awareness of halal food logo and checking halal meat credentials. They check halal logo with 2.13 mean and single respondents have less trust in halal logo. The mean of efforts of respondents is about middle (3.5) to find, eat and prevent contaminations with haram foods. Trusting restaurant owner, monthly average income, methods of verification, hearing halal labelling, buying halal labelled foods, not-personal source of information, frequency of eating and buying halal labeled foods, and the cleanliness of restaurant show significantly differences according to social status by One Way ANOVA test. Moreover, income level shows differences regarded to the frequency of eating halal as shown below with 0.05 significance level.

Age has a significant positive correlations with occupation, gender, frequency of eating halal, while, it has significant negative correlation with trust and labelling food. Gender has a significant negative correlation with just frequency of eating halal foods, looking credentials and checking halal logo. As the income increases, the age of respondents is also high and there is a high correlation of income level with education and occupation. Trust has a significant positive correlation with buying halal labelled foods. One of the strong correlations is between not contacting or including any ingredients and ordering halal food.

Table 5. ANOVA test for occupation

Items	F	Sig.
Trusting a restaurant owner saying that he sells halal foods	3,031	0,049
Your monthly average income level	72,150	0,000
How often do you eat halal	0,686	0,504
Have you heard about the halal labeled food?	10,005	0,000
Have you ever bought halal labeled food?	12,394	0,000
ImPersonal source of information	7,041	0,001
what is your education level	196,754	0,000
Experience	69,815	0,000
Social status	76,367	0,000
How often do you check the halal logo on food package	5,710	0,004
How often do you trust the halal logo on food products	3,850	0,022
How often do buy halal labeled food	4,767	0,009
I should be full sure that the restaurant has a halal status to eat there	3,421	0,033
it is important for me that the restaurant just order halal foods to eat there	9,635	0,000
Food not coming in contact with haram ingredients to eat there	9,345	0,000
the cleanliness of a restaurant must be high for me	9,425	0,000

Table 6. Correlations table of survey items

Items	A	B	C	E	F	G	H	I	J	K	L	N	M	O	P	R
Age(A)	1	,087	,55**	,66**	,082	,436**	,491**	-,104*	-,14**	-,130**	-,129**	,040	,004	,038	,077	,046
Gender(B)	,087	1	,065	,156	-,11**	-,025	,133**	-,14**	,12**	,047	,080	-,018	-,072	-,057	-,030	-,035
Occupation(C)	,55**	,065	1	,761**	,043	,663**	,455**	,005	-,12**	-,120**	-,137**	-,005	,049	,12**	,120**	,138**
Income level(E)	,66**	,156	,76**	1	,078	,744**	,656**	-,004	-,012	-,100	-,069	-,096	-,237*	-,168	-,127	-,216*
Frequency of eating halal(F)	,082	-,11**	,043	,078	1	,051	,079	-,163**	-,058	-,037	-,100*	,069	,049	,053	,058	,031
Education level(G)	,43**	-,025	,66**	,744**	,051	1	,267**	,025	-,15**	-,104*	-,095*	-,043	,008	,026	,013	,068
Social status(H)	,49**	,13**	,45**	,656**	,079	,267**	1	-,080	-,079	-,131**	-,110*	,013	-,028	-,019	,041	,087
Looking at the credentials of a meat distributor (I)	-,104*	-,14**	,005	-,004	-,16**	,025	-,080	1	,17**	,191**	,103*	,001	,035	,029	,023	,034
Checking halal logo (J)	-,14**	,12**	-,12**	-,012	-,058	-,15**	-,079	,179**	1	,297**	,428**	,014	-,077	-,047	-,034	,009
Trusting the halal logo (K)	-,13**	,047	-,12**	-,100	-,037	-,104*	-,131**	,191**	,29**	1	,391**	,080	,112*	,049	,047	,063
Buying halal labeled food(L)	-,12**	,080	-,13**	-,069	-,100*	-,095*	-,110*	,103*	,42**	,391**	1	,051	,054	,060	,045	,066
Putting effort to find halal restaurant(N)	,040	-,018	-,005	-,096	,069	-,043	,013	,001	,014	,080	,051	1	,48**	,40**	,34**	,25**
being full for halal status (M)	,004	-,072	,049	-,237*	,049	,008	-,028	,035	-,077	,112*	,054	,48**	1	,68**	,597**	,575**
Just ordering halal foods to eat there(O)	,038	-,057	,12**	-,168	,053	,026	-,019	,029	-,047	,049	,060	,40**	,687**	1	,722**	,643**
Not coming in contact with haram ingredients (P)	,077	-,030	,120**	-,127	,058	,013	,041	,023	-,034	,047	,045	,34**	,597**	,72**	1	,569**
Cleanliness of restaurant(R)	,046	-,035	,13**	-,216*	,031	,068	,087	,034	,009	,063	,066	,25**	,575**	,64**	,569**	1

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

5. MODELLING HALAL AWARENESS

50 questions with return of 500 surveys were asked in this section to group halal items with 2.971 total mean of all 50 items. "Manufacturers deceiving on its halal certificates should be penalized accordingly" question has the 3.58 the highest mean. Monitoring, getting halal certificate in Iraq Kurdistan, awarding halal certificate, warranty on halal products, preventing frauds and being high quality are other important items with a mean greater than 3. "Halal products are for Muslim only" question has the lowest mean with 2.46 and buying halal from internet, buying halal products at discount and giving a free gifts items are other low mean questions. To check the reliability of items, Cronbach's Alpha is found 0.931. Moreover, covariance matrix has 0.019 Determinant. Kaiser-Meyer-Olkin Measure of Sampling Adequacy with 0.91 is high enough. Bartlett's Test of Sphericity shows that null hypothesis can be rejected with sig. 0.000 value. Thus, principal component analysis can be carried out based on these minimum criteria. 60.342% of total variance is explained by first 10 items and first three items explain 42% of total explained variance. The figure below measuring eigentvalue against total factors shows the effects of each factor. So, after 4 factors, each factor represents a smaller amount of variance.

Rotated Component Matrix is used to categorize each item under a group. Ten groups (Certificate

with 9 items, quality and features with 7 items, advertisement with 6 items, place with 6 items, discount, for Muslims only with 5 items, differences with 4 items, price with 3 items and closeness and learning from around with each one item) are created from factor analysis of Principal Component Analysis with Rotation Method: Varimax with Kaiser Normalization and Structure Matrix while There are 11 factors promotion, place, attractive and quality, halal certification, price, product samples, market demand, SME (Small and Middle Size Entrepreneurships) producers, halal certification to Muslim companies, difference between halal certified and non certified and clean operation from study of Dali et al. [16].

5.1 Logistic Regression for Halal Certification

The model fitness, Hosmer and Lemeshow test with Sig.: 0,329>0.05, H0: The hypothesized model is fit with the data is accepted. There are 277 responses at prediction stating that halal certified products are more expensive than non-certified products however there are 260 observed respondents. Hence, there is 94.2% of accuracy for expensive section and 49.2% for not expensive section. The overall correct percentage for both is 85.2% according to classification table with a cut value of 0.5 by giving 0 score to value less than 3 and 1 to more than 3 in likert scale.

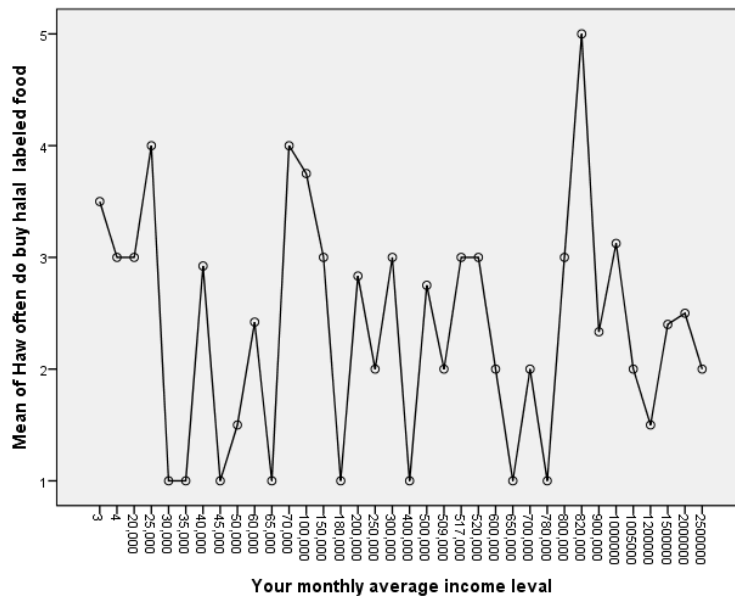


Fig. 2. Income level and frequency of buying halal labelled foods

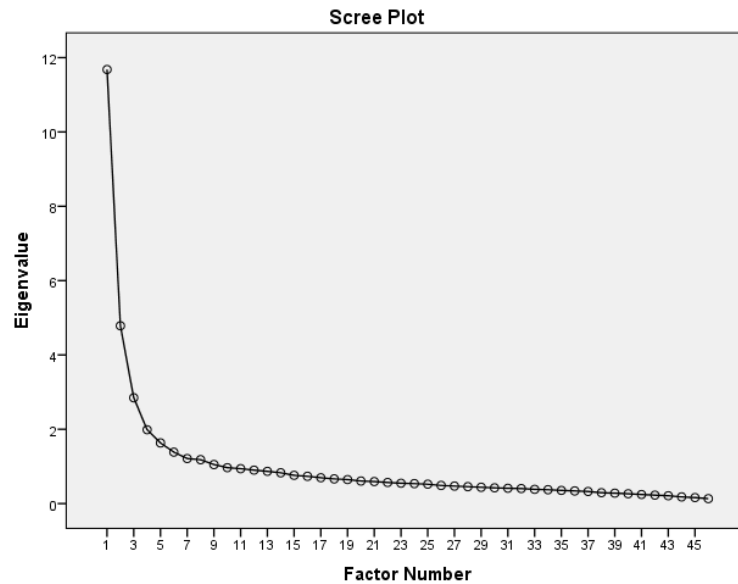


Fig. 3. Eigenvalue of variance

Middle point of three respondents in likert-scale is not calculated in that model. There is not any significant correlations between differences and selling just halal products with 0.05 sig. Level whereas there are significant correlations among other factors as seen below.

Dependent Variable: ExpensiveHalal{0,1} binary value with 0.05 **significance level and 0.1* significance level for differences group with 0.563 R value. From logistic regression result, it can be said that halal certified products are generally more expensive than without the halal certification products. In Dali et al. [16] model, Promotion with positive correlation, place with negative correlation, market demand and SME producers with positive correlation and clean operations with negative correlations were found significant with -2.567 constant value. However, market demands, SME products and clean operations have less than 3 items in each group and price is already a dependent value in the model. Hence, they were excluded from this model.

$$\ln(p/(1-p)) = -4.793 + 0.885 \times \text{Certificate} + 0.599 \times \text{Promotions} + 0.365 \times \text{SellingJustHalal} + 0.312 \times \text{Differences}$$

$$p/1-p = e^{-4.793 + 0.885(\text{Certificate})^{**} + 0.599(\text{Promotions})^{**} + 0.365(\text{SellingJustHalal})^{**} + 0.312 \times \text{Differences}^*}$$

Certificate and advertisements have differences according to Anova test for education level. As

the education level increase, the mean score for each level of certificate, price, selling just halal products, and trust is higher than low level education. Quality of services and attractiveness, promotions, place, differences and advertisements groups' scores are higher for secondary school graduates than diploma students.

Certificate, Quality and Services Feasters and Advertisements have differences according to age with One-Way Anova test less than 0.05 sig. value. As the age increases, people want to see the certificate more with significant differences between 20-30 and 31-40 age groups. Quality of services and attractiveness are more important for 41+ age group with significant differences of 20-30 age group. Moreover, there are significant differences according to all three age groups (20-30, 31-40 and 40+) and with increasing age, the means are higher. Quality of services and attractiveness and trust factors show significant differences according to ANOVA test. Furthermore, certificates and advertisements factors show differences according to income level at the 0.05 significance level.

5.2 Linear Regression Model

Dependent Variable (Products with halal certification are relatively more expensive compared to—certified products non)

with R:0. 57 and 0.05 **significance level and 0.1* significance level for differences is shown below. Dependent Variable = 0.173*+0.345×Cert**+ 0.191×Promotions** +0.163× Differences**+0.122×Place**+0.169×Trust

Table 7. Pearson correlation

Group	Expensive halal	Cert.	Quality and services	Advert.	Place	Promotions	Selling just halal	Diff.
Expensive halal	1,000	0,513	0,317	0,241	0,302	0,356	0,345	0,239
Certificate	,513	1,000	0,440	0,262	0,346	0,345	0,517	0,154
Quality and Services	,317	0,440	1,000	0,353	0,524	0,463	0,224	0,340
Features								
Advertisements	,241	0,262	0,353	1,000	0,589	0,332	0,166	0,369
Place	,302	0,346	0,524	0,589	1,000	0,406	0,211	0,288
Promotions	,356	0,345	0,463	0,332	0,406	1,000	0,171	0,435
SellingJustHalal	,345	0,517	0,224	0,166	0,211	0,171	1,000	0,075
Differences	,239	0,154	0,340	0,369	0,288	0,435	0,075	1,000

Table 8. Multiple comparisons with Tukey HSD

Dependent variable	(I) what is your education level	(J) what is your education level	Mean difference (I-J)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Certificate	Secondary school	Diploma	,02945	,12957	,996	-,3046	,3635
		B.ch	-,45421*	,13202	,004	-,7945	-,1139
		Higher Degree	-,70130*	,25595	,032	-1,3611	-,0415
	Diploma	Secondary school	-,02945	,12957	,996	-,3635	,3046
		B.ch	-,48366*	,14966	,007	-,8695	-,0979
		Higher Degree	-,73075*	,26548	,031	-1,4151	-,0464
	B.ch	Secondary school	,45421*	,13202	,004	,1139	,7945
		Diploma	,48366*	,14966	,007	,0979	,8695
		Higher Degree	-,24709	,26669	,791	-,9345	,4404
	Higher Degree	Secondary school	,70130*	,25595	,032	,0415	1,3611
		Diploma	,73075*	,26548	,031	,0464	1,4151
		B.ch	,24709	,26669	,791	-,4404	,9345
Advertisements	Secondary school	Diploma	,17403	,10597	,356	-,0991	,4472
		B.ch	-,10172	,10797	,782	-,3801	,1766
		Higher Degree	-,38037	,20934	,266	-,9200	,1593
	Diploma	Secondary school	-,17403	,10597	,356	-,4472	,0991
		B.ch	-,27575	,12241	,111	-,5913	,0398
		Higher Degree	-,55441	,21713	,053	-1,1141	,0053
	B.ch	Diploma	,10172	,10797	,782	-,1766	,3801
		Secondary school	,27575	,12241	,111	-,0398	,5913
		Higher Degree	-,27865	,21812	,578	-,8409	,2836
	Higher Degree	Secondary school	,38037	,20934	,266	-,1593	,9200
		Diploma	,55441	,21713	,053	-,0053	1,1141
		B.ch	,27865	,21812	,578	-,2836	,8409

*. The mean difference is significant at the 0.05 level

6. DISCUSSION AND FUTURE RESEARCHES

Halal foods concept takes its roots from religions and there are some similarities for both Islam and Judaism religions in that topic. However, Muslim consumers want a standard halal certification around the World rather than Kosher Jewish standard. Some Muslims use Jewish halal certification standards, but many Muslims are not totally sure that these standards are halal for Muslims. Hence, there is a need of comparing Muslim and Jewish halal certifications to find similarities and differences. In Europe, there are many Jewish halal certification standardized products and restaurants. More than 40 million Muslims live in Europe and in some situations; they buy Jewish halal certificated foods. Moreover, many Muslims are disappointed due to not having a global halal certification and using other religions standards even there are about 1.7 billion Muslims around the World. Many Muslim countries have different food consumption habits and cultures. However, each country uses its own standards. Government supported TSE translated Malaysian standards to use for its certification in Turkey, while GIMDES does not agree with JAKIM on some topics. Turkish citizens are not sure which standard is more trustable. Hence, there is a need of comparing certifications in Turkey and determining the trust level to each organization. Many people think that these certifications body do not do their job and controls well but to concentrating on earning money coming from certification. Many Muslim countries buy products from Turkey and they want to see the halal label on these products. This is the main reason that Turkish governments have started to give certification under TSE. Moreover, certification is done by some private organization for earning money and gets profit. Thus, they do not make necessary lab and area controls but just distributing certificates. There are not strong punishments against frauds done in halal food and certification. Even, some firms have halal certification; they start to use haram ingredients after controls. Thus, confidential customer and unannounced checks are done by GIMDES. However, they do not have a country wide checking control points. Hence, the same product in Istanbul can contain haram ingredients in other parts of Turkey. Different denominations of Islam in Turkey are another problem of district interpretation of halal standards. Also, some local organizations are trying to give halal certificates in Turkey. Another problem in Turkey, many

firms producing foods and services are Christian investments and they apply the same core production methods in Turkey without having halal certification. These firms are supported by huge media advertisements and lobbies. Many people do not trust these firms about the ingredients and production methods. They may also use GMO foods due to being cheaper or pork products. Another search is necessary to control halal products countrywide and detect GMO foods.

Another crucial discussion is carried out about GMO foods and drugs or pesticides used in foods such as giving hormones and antibiotics to chickens to get more chicken meat. Some people are trying to stop GMOs and toxic pesticides. However, big food lobby has a great political support around the World especially in USA. It is stated by Aslan [47] that cancer, diabetics, hypertension, brain damage, unparallel body structure, changes in tissues can be increased due to GMO foods and stated that *"we are what we eat and we pay the consequences positive or negative"*. Some experts says that GMOs can be used for the benefits of humanity with increasing population and it is halal while some other scholars are against that and they say they are harmful for human. Moreover, they state that any changes in DNA can create changes in other fields and environment. Schubert [48] stated that glyph sate herbicide can increase cancer and tumour growth. Ayyadurai and Deonikar [49] sated that GMO soybean cause cancer. While some other firm supporting Scientifics conclude that GMOs are safe and their searches are used by food lobby. While, Lal [50] from Ohio State University suggests to use holistically grown foods named as organic foods for stable, long-lasting remnants of decaying organic material, essential to soil fertility and growing nutrient-rich crops. Chemical fertilizers and confined animal feedlot operations (CAFOs) creates more greenhouse gases than all transportation methods, which is responsible of between 20 to 30 percent of greenhouse gases resulting in climate change (Roulac [51]). It is found by Dr Arpad Pusztai [52] that GMO potatoes produce a toxic poison which damage organs of body immune defects and other health problems by trial experiments on rats (Huber [53]). This kind of discussions will go further and there are the needs of studies in both fields in Turkey, at where GMOs and pesticides are allowed partly.

It is found by the Farming Systems Trial at Rodale Institute that organic farming is better

than conventional agriculture by farming conventional and organic farming for 30 years. Organic farming give less crops in first few years, but after few years, organic farming gives more crops by less greenhouse gases of 40%, using 45% less energy, better performing in years of drought and making soil more sustainable instead of depleting it as seen in appendix. Moreover, organic farming produces more profit in long run without contaminating any water supply. Pesticides (herbicides, insecticides, fungicides, etc.) are mainly toxic to human body and cause many illnesses (RI [54]). To protect the environment and people, Scotland has banned GMOs foods in 2015 (FD [55,56]).

7. CONCLUSION

Many differences like denominational differences create the biggest problem in preventing an international halal standards development. Furthermore, not having a global Muslim halal certification head cause to many different halal standards around the world. Excluding Malaysia and Indonesia, many Muslim governments do not make great supports for halal certification and awareness. The logic behind these banns is to protect health of people and environment. There is an urgent need for a head of Muslim halal standards like ISO otherwise Muslims consumption habits and religious differences can be used in bad faith and force them to eat haram foods. Without government's supports, there are problems among certificate providers in Turkey due to not having similar standards, regular checking and less punishment. As it is seen in Erbil study, people are not sure about halal state of foods exported from Turkey.

It is stated in Islam that foods dangerous to human body and environments are haram. However, GMO foods are partly or illegally sold in Turkey. It is difficult to detect pig DNA in some foods. Thus, there is a need of international and national standards and controls by governments. Food firms are trying to earn more money while governments are responsible for citizens. It is difficult to control pesticides used in plants and soil since some farmers sell their products to market directly. Many greengrocers are not controlled and thus they sell every kind of foods. Moreover, they buy fruits and vegetables directly from the field without any control. As a summary, GMOs used labels, used pesticides and drugs in foods, slaughtering type, and ingredients are defined clearly on every kind of foods can help people what they consume

otherwise higher productivity at all costs will happen globally.

ACKNOWLEDGEMENTS

Surveys at Erbil City were carried out by Hilmit Fouad Khudhurdhur and Abdullah Mohammed Ozer master students of Business Administration at Bingöl University.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Wiki. World Population; 2015. Available: https://en.wikipedia.org/wiki/World_population (Accessed 7 August 2015)
2. Boyraz N. Gıda değil zehir yediyorlar; 2012. Available: <http://www.gidahareketi.org/Doc-Dr--Nuh-Boyraz--Gida-Degil-Zehir-Yediyorlar-1401-haberi.aspx> (Accessed 8 August 2015)
3. Sİ-Sorularla İslamiyet, 2015. Available: <http://m.sorularlaislamiyet.com/index.php?oku=13478> (Accessed 8 August 2015)
4. Jinna M. Halal India Manager - Int'l Business Development United World Halal Development (UNWHD), Singapore; 2015.
5. Hazzah K. Are GMO's Halal? 2000.
6. Üstün N. Türkiye – Kuzey Irak ilişkileri ve ekonomik yansımaları, etüd-araştırma servisi, Konya Ticaret Odası, Türkiye. 2013.
7. GİMDES. Halal; 2015. Available: <http://www.gimdes.org/> (Accessed 10 November 2015)
8. Özer K. Helâl sertifika paradoksu, Gıda Güvenliği Harekatı; 2010. Available: <http://www.gidahareketi.org/Hel%C3%A2l-Sertifika-Paradoksu-353-yazisi.aspx> (Accessed 7 August 2015)
9. TSE1, Costing; 2015. Available: <http://www.tse.org.tr/tr/icerikdetay/9/18/ucretlendirme-esaslari-ve-ucret-cizelgeleri.aspx> (Accessed 6 August 2015)
10. HP-Halal Platform, "Firmalar"; 2015. Available: <http://www.helalplatform.com/helal-gida-sertifikasi-veren-firmalar.html> (Accessed 18 July 2015)

11. TSE2. Helal Gıda Sertifikası TSE tarafından nasıl veriliyor; 2015. Available:<https://www.youtube.com/watch?v=E6jdWlB6dS8> (Accessed 9 August 2015)
12. GH. Türkiye'de GDO yasak değil; 2013. Available:<http://www.gidahareketi.org/Turkiye-de-Gdo-Yasak-Dejil--1768-haberi.aspx> (Accessed 11 August 2015)
13. Timeturk. GDO'ya izin verildi mi? 2014. Available:<http://www.timeturk.com/tr/2014/05/29/gdo-ya-izin-verildi-mi.html> (Accessed 11 August 2015)
14. Bal B. "Türkiye'de GDO denetimi gerçekleri"; 2015. Available:<http://www.yesilist.com/cms.php?u=turkiye-de-gdo-denetimi-gercekleri&id=1495> (Accessed 8 August 2015)
15. Kostak F. Helal Gıda Belgesi; 2015. Available:<http://www.etikadanismanlik.com/fky24.htm> (Accessed 5 August 2015)
16. Dali NRSBM, Nooh MNB, Nawai NB, Mohammad HB. Is halal products are more expensive as Perceived by the consumers? Muslimpreneurs challenges and opportunities in establishing a Blue ocean playing field. *Journal of Management & Muamalah*. 2009;2:39-62.
17. Al-Baqarah (n.d). The Holy Quran, Chapter 57, v.110.
18. Holy Koran, Surah Al Maidah, verse 3.
19. Nakyinsige K, Man YBC, Sazili AQ. Halal authenticity issues in meat and meat products. *Meat Science*. 2012;91:207-214.
20. Spiegel M, Fels-Klerx HJ, Terrenburg P, Ruth SM, Scholtens-Toma IMJ, Kok EJ. Halal assurance in food supply chains: Verification of halal certificates using audits and laboratory analysis. *Trends in Food Science & Technology*. 2012;27:109-119.
21. Teng PK, Jusoh WJW, Siong HK, Mesbahi MM. Awareness, recognition and intention: Insights from a non-Muslim consumer survey regarding halal labeled food products in Malaysia. 3rd International Conference on Management (3rd ICM 2013) proceeding, Penang, Malaysia; 2013.
22. AAFC-Agriculture and Agri- Food Canada. Global Halal food market; 2011. Available:<http://www.ats.agr.gc.ca/inter/4352-eng.pdf>. (Accessed 12 July 2012)
23. Alqudsi SG. Awareness and demand for 100% Halal supply chain meat products. *Procedia - Social and Behavioral Sciences*. 2014;130:167-178.
24. Omar WM, Muhammad MZ, Che Omar A. An analysis of the Muslim consumers' attitudes towards 'halal' food products in Kelantan. Universiti Teknologi MARA, Kelantan; 2010.
25. Jamal A, Sharifuddin J. Perceived value and perceived usefulness of halal labeling: The role of religion and culture. *Journal of Business Research*. 2015;68:933-941.
26. Yunusa NSNM, Rashid WEW, Ariffina NM, Rashid NM. *Procedia - Social and Behavioral Sciences*. 2014;130:145-154.
27. Ismoyowati D. Halal food marketing: A case study on consumer behavior of chicken-based processed food consumption in central part of Java, Indonesia. *Agriculture and Agricultural Science Procedia*. 2015;3:169-172.
28. Tieman M, Ghazali. Halal control activities and assurance activities in halal food logistics. *Procedia - Social and Behavioral Sciences*. 2014;121:44-57.
29. DSM-Department of Standards Malaysia. MS 2400-1:2010 (P): Halalan-Toyyiban Assurance Pipeline", Part 1: Management system requirements for transportation of goods and/or cargo chain services, Malaysia; 2010.
30. Zulfakar MH, Anuar M, Ab Talib MS. Conceptual framework on halal food supply chain integrity enhancement. *Procedia - Social and Behavioral Sciences*. 2014;121:58-67.
31. Khan FJM. Halal traceability: The assurance of safety, quality and authenticity. *The Halal Journal*. 2008;46-47.
32. Omar A. The Platform for A Global Halal Standard. *The Halal Journal*; 2008.
33. BBC. Food Company Freeza Meats fined £70,000 costs; 2015. Available:<http://www.bbc.com/news/uk-northern-ireland-33317601> (Accessed 14 August 2015)
34. Saida M, Hassan F, Musa R, Rahman NA. Assessing consumers' perception, knowledge and religiosity on Malaysia's Halal Food Products. *Procedia - Social and Behavioral Sciences*. 2014;130:120-128.
35. Wright W, Annes A. Halal on the menu?: Contested food politics and French identity in fast-food. *Journal of Rural Studies*. 2013;32:388-399.

36. Yusofa S, Shutto N. The development of halal food market in Japan: An exploratory study. *Procedia - Social and Behavioral Sciences*. 2014;121:253-261.
37. Shahidan S, Md Nor O. Halal certificate: An international marketing issues and challenges; 2006.
Available:http://www.ctwcongress.de/ifsam/download/track_13/pap00226
(Accessed 21 June 2012)
38. Jihan A, Hashim CM, Musa R. Factors influencing attitude towards halal cosmetic among young adult urban Muslim women: A focus group analysis. *Procedia - Social and Behavioral Sciences*. 2014;130:129-134.
39. Godoy E, 2014, Pope Francis Joins Battle Against Transgenic Crops.
Available:www.ipsnews.net/2015/08/pope-francis-joins-battle-against-transgenic-crops/ (16.08.2015)
40. GR1. GMOs; 2004.
Available:http://www.gidaraporu.com/genetik-yapisi-degistirilmis-gidalar_g.htm
(Accessed 12 August 2015)
41. GR2. GMO; 2005.
Available:http://www.gidaraporu.com/genetik-yapisi-degistirilmis-urunler-gdo_g.htm
(Accessed 12 August 2015)
42. GR3. GDOLu Ürünler için Türkiye Açık Pazar; 2008.
Available:http://www.gidaraporu.com/gedolu-urunlar-icin-acikpazar_g.htm
(Accessed 12 August 2015)
43. GİMDES. Halal; 2015.
Available:<http://www.halalcertificationturkey.com/>
(Accessed 13 August 2015)
44. Aris A, Leblanc S. Maternal and fetal exposure to pesticides associated to genetically modified foods in Eastern Townships of Quebec, Canada. *Reprod Toxicol*. 2011;31:528-533.
45. Sullivan R. Coca-Cola funds scientific body who says lack of exercise — not bad eating — is to blame for obesity crisis; 2015.
Available:<http://www.news.com.au/lifestyle/food/coca-cola-funds-scientific-body-who-says-lack-of-exercise-not-bad-eating-is-to-blame-for-obesity-crisis/story-fneuz92c-1227480397784>
(Accessed 16 August 2015)
46. Halal Hub. Halal Certification. 2015.
Available:<http://www.halalhubusa.com/certification/> (Accessed 14 August 2015)
47. Aslan I. GMOs; 2015.
Available:<http://beopen.blogcu.com/genetik-ally-modified-foods-gmo-genetigi-degistirilmis-gida-gdo/17006723>
(Accessed 7 August 2015)
48. Schubert SD. Head of the cellular neurobiology laboratory at the Salk Institute for Biological Studies in La Jolla, California, to EcoWatch. It should be banned; 2015.
Available:http://www.naturalnews.com/050732_Monsanto_glyphosate_IARC.html#ixzz3ibWjhhtp
(Accessed 7 August 2015)
49. Ayyadurai VAS, Deonikar P. GMO soybean; 2015.
Available:<http://www.fnbnews.com/article/detnews.asp?articleid=37639§ionid=1>
(Accessed 12 August 2015)
50. Lal R. Nutiva, organic farming and soil; 2015.
Available:<http://ecowatch.com/2015/01/06/regenerative-organic-agriculture/> (Accessed 13 September 2015)
51. Roulac JW. The solution under our feet: How regenerative organic agriculture can save the planet; 2015.
Available:<https://www.organicconsumers.org/news/solution-under-our-feet-how-regenerative-organic-agriculture-can-save-planet>
(Accessed 13 August 2015)
52. Pusztai A. rpad Pusztai: Biological divide; 1998.
Available:<http://www.theguardian.com/education/2008/jan/15/academicexperts.highereducationprofile>
(Accessed 14 August 2015)
53. Huber D. The truth about GMOs with Dr. Don Huber; 2015.
Available:<http://www.valleynewslive.com/news/pov/headlines/The-Truth-About-GMOs-with-Dr-Don-Huber-297181531.html>
(Accessed 14 August 2015)
54. RI-Rodale Institute. Farming systems; 2015.
Available: www.rodaleinstitute.org
(Accessed 14 August 2015)
55. FD-Food Democracy. Scotland Declares Freedom From GMOs;2015.
Available:<http://www.fooddemocracynow.org/blog/2015/aug/11-0>
(Accessed 14 August 2015)
56. Economic & Agriculture Research Associate; 2000.
Available:<http://www.agbioworld.org/biotech-info/religion/halal.html> (10.08.2015)

APPENDIX

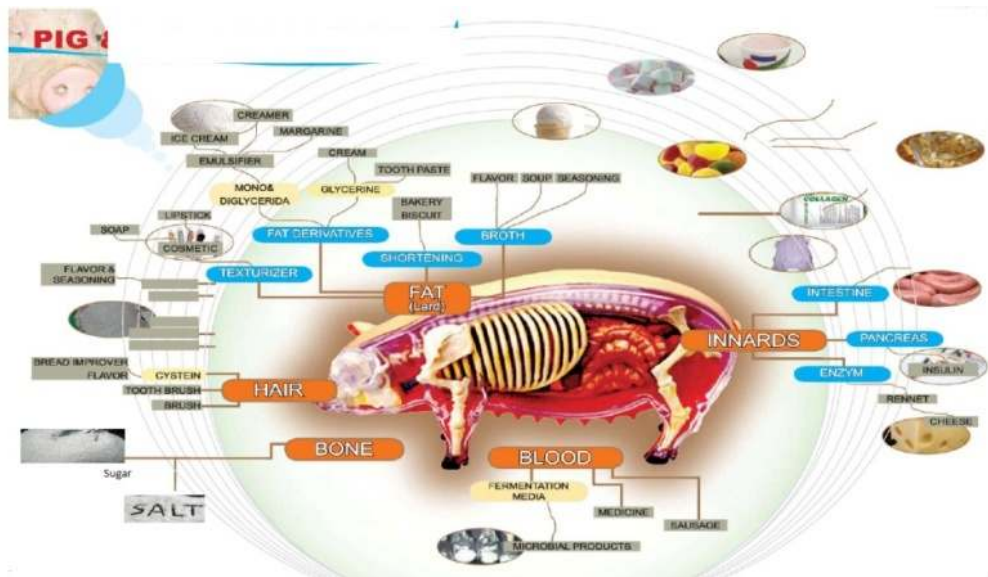


Fig. 1. Pig and its derivatives
Source: Halal India R&D Division Version 01

Every ounce of Pig 05049 was used, helping create an astonishing 185 products. Here are some of the more surprising uses for the animal - and a diagram to show just which bit of the beast, from the trotter to the snout, is used where...

1 Chemical weapons testing: Because of the pig's similarity to human tissue

2 Ice cream: Gelatine regulates the sugar crystallisation and slows down the melting process

3 Fertiliser: Made from processed pig hair

4 Low fat butter: Gelatine used for texture

5 Beer: Gelatine used as a clarifying agent. Reacts with bitter substances and tannins to absorb cloudy elements, leaving clear drinks

6 Fabric softener: Fatty acids from bone fat give colour

7 Paint brush: Made from pig hair

8 Fruit juice: Gelatine absorbs cloudy elements to give clear drinks

9 Shampoo: Fatty acids from bone fat are used to give them a pearly-like appearance

10 Candle: Fatty acids from bone fat are used to stiffen the wax and raise the candle's melting point

11 Bread: Protein from pig hair is used to soften dough

12 Bullets: Bone gelatine used to help transport the gunpowder or cordite into the casing

13 Medicine tablets: Gelatine is used in the shell to give it hardness

14 Washing powder: Fatty acids from bone fat harden the substance

15 Paint: Fatty acids from bone fat increase gloss

16 Tambourine: Made from the pig's bladder

17 Wine: Gelatine absorbs cloudy elements to give clear drinks

18 Paper: Bone gelatine is used to improve stiffness and reduce moisture

19 Heparin: Used to stop the formation of blood clots, it is taken from the mucus in the intestines

20 Soap: Fatty acids from bone fat act as a hardening agent and give colour

21 Corks: Bone gelatine is used as a binder

22 Insulin: Taken from the pancreas, as closest to human in chemical structure

23 Yoghurt: Pig bone calcium is used in some yoghurts

24 Cigarettes: Haemoglobin from the blood used in cigarette filters to create an artificial lung that supposedly lessens harmful chemicals reaching the smoker

25 Photographic film: Bone gelatine acts as a bonding agent on the film sheet

26 Dog food treat: Haemoglobin used as a red colouring agent

27 Photodynamic therapy: Haemoglobin used in drug to treat retina decay in the eye. Drug is activated by shining laser into eye

28 Moisturisers: Fatty acids from bone fat used

29 Dog snack: Deep fried pig nose

30 Crayons: Fatty acids are used as a hardening agent

31 Shoes: Bone glue is used to improve the texture and quality of the leather

32 Train brakes: Bone ash used in production

33 Toothpaste: Glycerine from bone fat is used to give toothpaste texture

34 Hide glue: A strong glue used in the woodworking industry derived from collagen

35 Face mask: With collagen to help reduce wrinkles and lines

36 Alternative energy: Waste products used as fuel to produce electricity

37 Energy bar: Treated collagen is cheap source of protein for body builders

38 Cream cheese: Gelatine used to make it stable

39 Whipped cream: Gelatine gives texture

40 Sweets: Porcine gelatine used as a binding and gelling agent and to ensure the right texture is found in the following: liquorice, wine gums, chewing gum

How a 16 stone 31b pig breaks down...

Meat	119lb	52.1%
Bones	33lb	15%
Internal organs	31lb	13.6%
Miscellaneous	14lb	6.3%
Blood	12lb	5.3%
Fat	12lb	5.3%
Skin	6.6lb	2.9%

Fig. 2. Pig products

Source: Marcus Dunk, 2009, *Bullets, bread and beer, tambourines and toothpaste... and the 180 other things you can do with a PIG*

<http://www.dailymail.co.uk/sciencetech/article-1217794/From-bullets-bread-beer-tambourines-toothpaste--plus-180-things-pig.html>,



Fig. 3. Organic and Conventional farming

Source: RI-Rodale Institute, 2015, "Farming systems" www.rodaleinstitute.org (14.08.2015)

Table 1. Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11,680	25,390	25,390	11,680	25,390	25,390	6,582	14,310	14,310
2	4,784	10,399	35,789	4,784	10,399	35,789	3,735	8,120	22,430
3	2,846	6,187	41,977	2,846	6,187	41,977	3,882	8,004	30,434
4	1,988	4,321	46,298	1,988	4,321	46,298	3,821	7,871	38,306
5	1,633	3,550	49,848	1,633	3,550	49,848	3,413	7,420	45,725
6	1,384	3,008	52,856	1,384	3,008	52,856	2,314	5,031	50,757
7	1,212	2,635	55,491	1,212	2,635	55,491	1,812	3,939	54,695
8	1,181	2,588	58,059	1,181	2,588	58,059	1,314	2,856	57,551
9	1,050	2,283	60,342	1,050	2,283	60,342	1,284	2,791	60,342
10	,966	2,101	62,442						
11	,939	2,041	64,483						
12	,900	1,956	66,440						
13	,888	1,886	68,326						
14	,829	1,802	70,128						
15	,780	1,653	71,781						
16	,734	1,596	73,377						
17	,695	1,511	74,888						
18	,665	1,445	76,333						
19	,646	1,403	77,737						
20	,607	1,320	79,057						
21	,593	1,288	80,345						
22	,567	1,233	81,578						
23	,549	1,193	82,771						
24	,537	1,168	83,938						
25	,522	1,134	85,073						
26	,489	1,082	86,135						
27	,471	1,024	87,159						
28	,455	,989	88,148						
29	,439	,954	89,102						
30	,424	,922	90,024						
31	,413	,897	90,921						
32	,404	,879	91,800						
33	,382	,831	92,631						
34	,374	,813	93,444						
35	,354	,770	94,214						
36	,341	,741	94,955						
37	,327	,710	95,665						
38	,292	,635	96,300						
39	,280	,608	96,909						
40	,264	,573	97,482						
41	,244	,531	98,013						
42	,229	,497	98,510						

Table 2. Rotated matrix

	Component									
	1	2	3	4	5	6	7	8	9	10
	Certificate	Quality and Service	Advertisement	Place	Discount	For Muslims only	Difference	Price	Clearance	Learning from
28- it is important are to have warranty on halal products	.868									
27- manufacturers which deceive on its halal certificates should be penalized accordingly	.835									
31- halal products manufactured in kurdistan should get halal certification	.818									
26- halal certified products should be monitored from any fraudulence	.801									
30- halal products brand are important for consumers	.772									
29- halal certified products are suitable for global market	.760									
48- halal products are manufactured in clean operations	.525									
45- halal certification should be awarded to... (your country halal standard) manufacturer	.515									
33- food products with halal certification are generally more expensive than the one without halal certification	.504									
34- products with halal certification are relatively more expensive compared to-certified products non	.422									
32- i always buy the halal products at the promotion period	.410									
20- halal products in the market are in good quality		.683								
25- halal products in the market includes all types of consumers products		.681								
23- products with halal certification are normally in high quality		.660								
24- packaging of halal products in the market are suitable with current packaging		.654								
22- halal products in the market have attractive design		.615								0.4
21- the features of halal products in the market are according to consumer taste and current requirement		.568								
19- i always buy the halal products through at hyper market		.553								
18- i always buy the halal products through at the market		.414								
6- i always buy the halal products through radio			.843							
5- i always buy the halal products through newspaper			.783							
7- i always buy the halal products through service number			.753							
8- i always buy the halal products through brochure			.751							
10- i always buy the halal products through advertisement of TV			.580	.432						
9- i always buy the halal products through saying of shopkeeper			.490	.480						
14- i always buy the halal products through at the fast food restaurant				.722						
12- i always buy the halal products through at the stall				.676						
15- i always buy the halal products through at the restaurant				.674						
13- i always buy the halal products through at the place closed to my office				.630						
11- i always buy the halal products through words of mouyh (friends, relatives etc.)				.555						
16- i always buy the halal products through at the place closed to me house				.493						.4
17- i always buy the halal products through at the grocery				.437						.3
39- i always buy the halal products at discount					.723					
40- demand for halal products are determine by the size of the market					.698					
38- i always buy the halal products if it has a free gift					.661					
41- halal products with extra services are more attractive					.621					
43- products manufactured by SMEs are generally cheaper					.542					
44- SMEs halal food product manufacturers are more reluctant to give manufacturer discount compared to the large companies					.542					
42- halal food products are cheaper when being sold at hypermarket					.534					
3- it is important for me that the restaurant just order halal foods to eat there						.80				
2- i should be full sure that the restaurant has a halal status to eat there						.80				
4- it is important for me that food not come in contact with haram ingredients to eat there						.77				
4- the cleanliness of a restaurant must be high for me						.69				
1- i put so much effort to find halal restaurant						.65				
46- halal products are for Muslim only							.7			
49- i always buy the halal products through internet							.6			
47- the difference in term of price between halal food product in the same category is small							.6			
50- it is difficult to get product with halal certification							.5			
35- lower price means lower quality								.7		
36- i always buy the halal products after i tried the sample								.5		
37- price has always be the main determinant when purchasing halal food and beverages										.68

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

© 2016 Aslan and Aslan; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://sciencedomain.org/review-history/13371>