

ENVIRONMENT MANAGEMENT ACCOUNTING (EMA) PRACTICES IN HALAL FOOD PROCESSING MS1500:2009

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ABSTRACT

Halal food does not only relate to foods that are permissible for Muslims but it also has other dimensions within Islam itself. With the rapid increase in demand for halal food, the halal industry is no longer merely an industry that complies with religious requirements but is also becoming an economic force in its own right, both domestically and globally. Currently in Malaysia, the halal food processes are governed by MS 1500:2009, which focuses on halal and *toyyib* (good food processing). As the halal status is mentioned specifically, the *toyyib* concept is subjective, which shall include other Islamic requirements such as cleanness, avoiding wastage and effectively use of resources. Hence, in processing halal food, it can be said that other values which have some of Environment Management Accounting (EMA) features has been indirectly embedded in the process. Therefore, the main purpose of this paper is to investigate the EMA feature practices in halal food processing. A set of questionnaire was used and distributed to respondents who are involved in halal food industries. The result of the study is very encouraging where it revealed that halal food processing is concerned a lot on the use of resources effectively. This study concludes that halal food processing has indirectly embedded some of the EMA features within it and suggests a thorough study to be conducted to incorporate EMA features in Halal processes to strengthen the practice, especially on cost management.

Keywords: Halal Processing, Environmental Management Accounting, Management Accounting

Introduction

The basic principle of food in Islam, which shall be applied to all mankind is notified in the Qur'an, as God says;

يَا أَيُّهَا النَّاسُ كُلُوا مِمَّا فِي الْأَرْضِ حَلَالًا طَيِّبًا وَلَا تَتَّبِعُوا خُطُوَاتِ
الشَّيْطَانِ إِنَّهُ لَكُمْ عَدُوٌّ مُبِينٌ

O people, eat permissible good things out of what lies in the earth, and do not follow the footsteps of Satan; indeed, he is an open enemy for you. (Qur'an 2:168)

In this verse, two basic criteria of food are mentioned to be consumed by humans: *Halalan* and *Toyyiban*. *Halalan* is defined as permitted or acceptable by *shari'ah* law (Saadan & Zainal Abidin, 2014) and *toyyiban* can be described as nutritious, good quality, hygiene, authentic and safe (Saifuddeen, 2006). These are the basic principles of food to be consumed by human as being directed by God.

The halal concept in Islam has been specifically mentioned and determined such as the prohibition of pork and liquor; however, the *toyyiban* concept is a universal notion. According to Saadan & Zainal Abidin (2014), *toyyiban* is referred to the aspects of processing, preparation and handling of food as being specified by *shari'ah*. Thus, in halal food processing, *toyyib* is referred to as a good method used in ensuring the quality and safety of food (Mohamad & Chirs, 2014). As it is concerned, this concept fits with the UK food law and EU General Food Law in terms of the health risk associated to consumptions, and it is also associated with the hazard analysis and critical control points (HACCP) requirements (Mohamad & Chirs, 2014).

In Malaysia, the halal food processing is governed by MS1500:2009 *Halal Food - Production, Preparation, Handling and Storage - General Guidelines*, which covers on halal and *toyyib*. As the halal requirement has already been specified, the standard can be said covers largely on the processes to ensure the quality and safety of good (the *toyyib*). Determination of the good process in ensuring food quality and safety involves a lot of discretion on best practices. The discretionary in halal food processing consequently relates with other Islamic universal concepts such as prohibition of waste and utilisation of resources.

From the accounting perspective, the concept of *toyyib* in food processing can also be referred to the optimum utilisation of resources. This concept is similar to some features of Environmental Management Accounting (EMA), although the cost determinant is not specifically mentioned in the standard. Currently, there has been no study done to relate the *toyyib* concept with the EMA. Hence, the objective of this study is to examine the EMA feature practices in halal food processing. The specific research questions to be answered in this study are:

1. Does the halal food industry in Malaysia practice EMA?
2. Is there any significant relationship between halal food processes and optimum utilisation of resources?
3. How does the halal food industry benefit from their processing practice?

However, the EMA is a very wide concept. EMA can be defined as the process of identification, collection, estimation, analysis, internal reporting, and use of physical flow information (i.e., materials, water, and energy flows), environmental cost information, and other monetary information for both conventional and environmental decision-making within an organization (UNSD, 2001). For the purpose of this study, the EMA scope is limited to the MS1500:2009 requirement on the processes of (a) food safety and sanitation, (b) product flow and premise management, and (c) waste management.

This study is hoped to enhance the value of halal food processing as it can demonstrate the halal food is beyond the Muslims food issue, but it is a universal concept on food processing. By applying halal food processing, food producers not only produce halal and good food, but will enhance their operation in effectively using resources and preserving the environment.

Literature Review

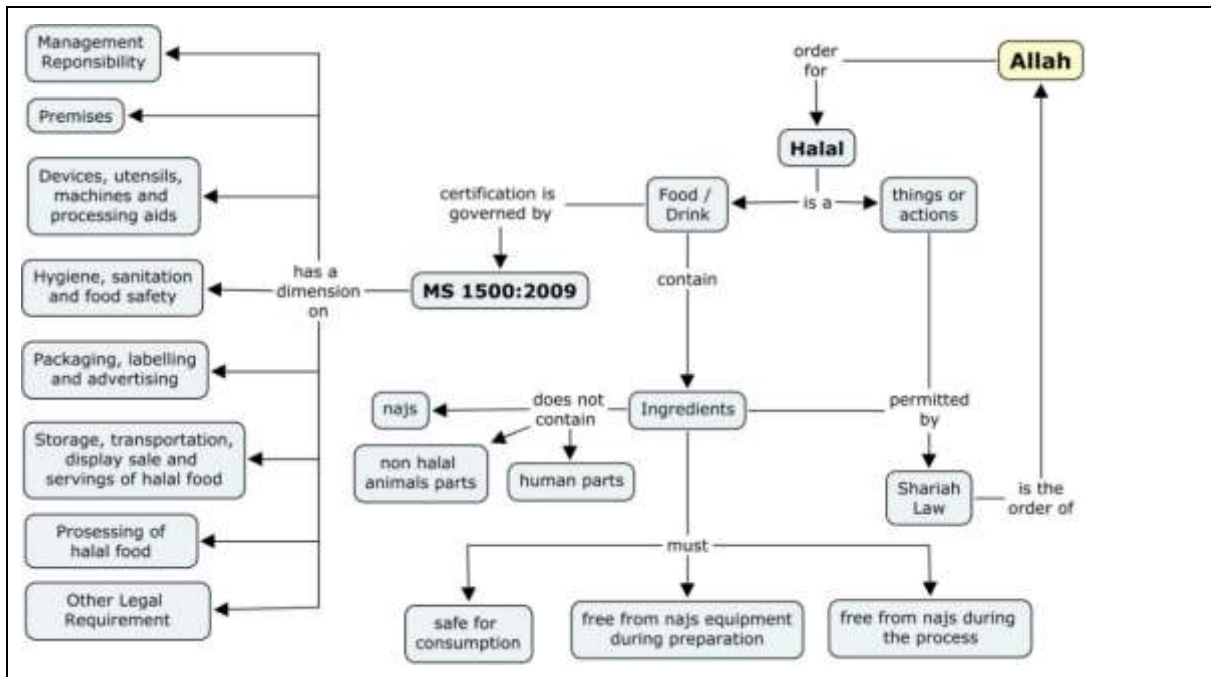
In Islam, anything edible are allowed, unless mentioned specifically in *shari'ah* law, such as prohibition of some foods mentioned by God, "*He has only prohibited for you carrion (flesh of dead animals), blood, the flesh of swine (a pig) and that upon which a name of someone other than Allah, has been invoked*" (Qur'an, 2:173). Also specifically prohibited by Prophet Muhammad PBUH, such as reported by Muslim, is that "*Every intoxicant is khamr (liquor), and every khamr is haram.*" And in another hadith, Prophet Muhammad PBUH said, "*Every fanged beast is forbidden to eat*".

The concept of food prohibition is expanded by the Jurists using '*illah* (legal reason), for example 'Umar declared from the pulpit of the Prophet Muhammad PBUH, "*Khamr* is that which befogs the mind" (Al-Qaradawi, 2001). Thus, jurists agreed that anything belongs to this group is also prohibited.

Besides specific prohibition foods mentioned, Islam highly encourages eating good foods. In the Qur'an, God says, "*O you who believe, eat of the good things We have provided to you and be grateful to Allah, if it is He whom you worship (in real terms)*" (Quran 2:173). Therefore, the food must not only be halal, but also need to be good and pure, from the aspects of quality, safety, hygiene and sanitation (Mohamad & Chirs, 2014).

In Malaysia, the certified halal food processing is governed by Malaysia Standard MS1500:2009. The standard prescribes practical guidelines for the food industry on the whole processes of preparing and handling of halal food, starting from the selection of raw materials until the distribution and marketing activities (Samori, Ishak & Kassan, 2014). In brief, the meaning of halal and its dimension covered by MS1500:2009 can be tabulated as in Figure 1.

Figure 1: The Meaning of Halal and Dimension Covered By MS1500:2009



The dimensions in MS1500:2009 cover the two basic principles of food in Islam, which are halal and *toyyib*. Sumali (2006) stated that halal certification issued by JAKIM indicated that the manufacturers and producers are getting the assurance that their ingredients, preparation, processing, hygienic and sanitation procedures not only meet the halal guideline, but are also consistent with HACCP and other established quality assurance guidelines.

Since halal has been mentioned specifically by *shari'ah*, the process of ensuring *toyyib* depends largely on the discretion of the best practice to ensure a good processing to produce good food. The MS1500:2009 covers much on the processing, which emphasises on cleanliness and hygiene, and requires effective use of resources and avoiding wastage. Food cannot be passed as halal if there is any indication that it is not a good food, for instance if it poses a health risk (Mohamad & Chirs, 2014). The MS1500:2009 requirement on the dimension and scope of halal and the process which relates to the use of resources effectively and avoiding wastage in halal processing can be tabulated as in Table 1.

Table 1: The Scope and Halal Processing MS1500:2009

Dimension	Scope	Requirement on the use of resources effectively and avoid wastage
Management responsibility	Ensuring suitable halal Muslim officers	<ul style="list-style-type: none"> Ensure that sufficient resources (i.e. manpower, facility, financial and infrastructure) are provided in order to implement the halal control system.
Premises	Building layout to ensure process flow is free from contamination	<ul style="list-style-type: none"> Layout of premises shall permit proper process flow, proper employee flow, good hygiene and safety practices, including protection against pest infestation and cross-contamination between and during operations. Product process flow from receipt of raw materials to the finished products shall prevent cross-contamination. The premises shall be designed to facilitate cleaning and proper supervision of food hygiene. Adequate sanitary facilities shall be provided and maintained. Loading and unloading bay shall be appropriately designed to allow effective transfer of perishable products. Premises shall be kept in good repair and condition to prevent pest access and to eliminate potential breeding sites. Pets and other animals shall be refrained from entering the premises.
Devices, utensils, machines and processing aids	Cleanliness of the devices used	<ul style="list-style-type: none"> Devices, utensils, machines and processing aids used for processing halal food shall be designed and constructed to facilitate cleaning.

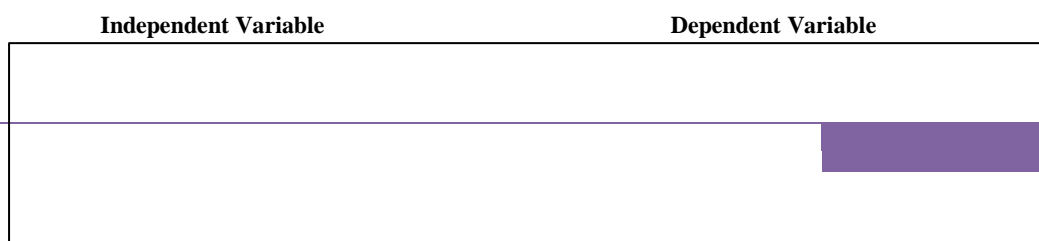
Hygiene, sanitation and food safety	Hygiene and sanitation during food processing	<ul style="list-style-type: none"> Hygiene, sanitation and food safety are prerequisites in the preparation of halal food, includes the various aspects of personal hygiene, clothing, devices, utensils, machines and processing aids and the premises for processing, manufacturing and storage of food. Halal food manufacturers shall implement measures to: <ol style="list-style-type: none"> inspect and sort raw material, ingredients and packaging material before processing manage waste effectively store harmful chemical substances appropriately and away from halal food prevent contamination of foods by foreign matters such as plastic, glass or metal shards from machinery, dust, harmful gas or fumes and unwanted chemicals, and prevent excessive use of permitted food additives Halal food shall be processed, packed and distributed under hygienic condition in premises licensed in accordance with good hygiene practices (GHP), good manufacturing practices (GMP), and public health legislation currently in force by the competent authority in Malaysia.
Processing of halal food	Processing halal animal and plant	<ul style="list-style-type: none"> Processed food or its ingredients shall be safe for consumption, non-poisonous, non-intoxicating or non-hazardous to health. Food shall be prepared, processed or manufactured using equipment and facilities that are free from contamination with <i>najis</i>.
Storage, transportation, display, sale and serving of halal food	Storage and transportation of the halal product	<ul style="list-style-type: none"> All halal food shall be segregated at every stage so as to prevent them from being mixed or contaminated with things that are non-halal. Transportation vehicles such as bonded truck shall be dedicated and appropriate to the type of the <i>halal</i> food and satisfy hygiene and sanitation condition.
Packaging, labelling and advertising	Packaging and labelling the halal product	<ul style="list-style-type: none"> the packaging material does not have any toxic effect on the halal food Packing process shall be carried out in a clean and hygienic manner and in sound sanitary conditions. Labeling material used in direct contact with the product shall be non-hazardous and halal.
Other requirements	Hygiene and safety for halal processing	<ul style="list-style-type: none"> The product shall in other aspects comply with legislation including other relevant requirements currently in force in Malaysia.

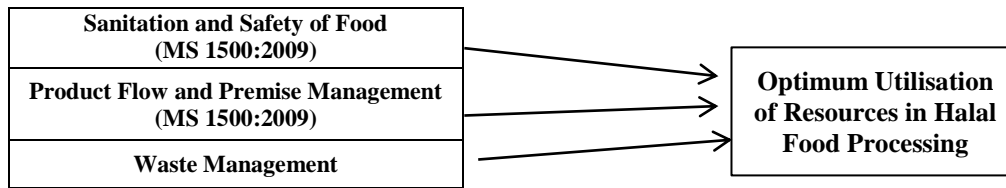
From the halal scope and requirement stated in the standard as above, it can be understood that the features of halal processing requirement have been embedded with some of the EMA features although it does not specifically mention about cost management. As far as the EMA is concerned, it is a tool designed to trace and track environmental costs and physical environmental flows (Burritt & Saka, 2006). EMA is said to be a mechanism to identify and measure the full spectrum of environmental costs of current production processes, and to integrate these costs and benefits into day-to-day business decision-making (UNSD, 2001).

Although the MS1500:2009 is not intended for EMA, the Islamic universal notions on the use of resources effectively, management of wastage and preserving the environment indicate the standard of halal processing have some EMA features. For the purpose of this study, the identified features that can be related to EMA in the food processing standard are regrouped into two variables, namely (a) sanitation and safety of food and (b) product flow and premise management. The overall requirement on waste management becomes the third variable.

All the three variables are important features for halal food processing and become independent variables for this study. These features are related to the *toyib* concept, which emphasises on the processes to produce nutritious, good quality, hygienic, authentic and safe foods (Saifuddeen, 2006). Among the objective of EMA is to trace information on the use, flows and destinies of energy, water and materials (including wastage) (UNSD, 2001), the term 'optimum utilisation' is used as dependent variable, to describe its feature. The schematic diagram to show the relationship between the independent variables and the dependent variable is illustrated in Figure 2.

Figure 2: The Relationship between Independent Variables and Dependent Variable





Since the *toyyib* concept in halal food processing is a universal notion, which shall include other Islamic universal concepts such as the effective use of resources, it is expected that some of the EMA features are indirectly embedded in halal processing. Therefore, from the schematic diagram, the following hypotheses are drawn for the second objective of the study.

- H1: There is a significant relationship between the sanitation and safety of food product with optimum utilisation of resources in halal food processing.
- H2: There is a significant relationship between the product flow and premise management with optimum utilisation of resources in halal food processing.
- H3: There is a significant relationship between waste management with optimum utilisation of resources in halal food processing.

Methodology

This study is a descriptive study, which aims to examine the EMA practices in halal food processing. This is the first ever study on the relationship between the halal food processing with EMA practices. Currently, based on the halal directory at Daganghalal website¹, there are 3,597 registered sellers with 18,187 qualified halal compliant products in Malaysia. For the purpose of this study, the sample is randomly taken from the exhibitors at the Malaysian International Halal Showcase (MIHAS) 2015. There are 528 exhibitors from 21 countries who took part in MIHAS. Only the exhibitors from Malaysia are taken as samples for this study.

Since MIHAS is a well-known venue for halal showcase throughout the world, it can be assumed that all the exhibitors involved are established halal food companies, as they are ready to penetrate the international market. They have followed the requirement on halal processing as stipulated in MS1500:2009 and Good Manufacturing Process² (GMP). Therefore, they are the best respondents to answer about halal food processing and its relation to EMA practices.

The questionnaire is taken from the study by Salina, Rohayati, Suzaida, Mohd Rizuan, & Noraina Mazuin (2011). In their study, the questionnaire is developed based on the requirement of MS1500:2009. The eight dimensions in their questionnaire are reduced to two variables, which are (a) sanitation and safety of food and (b) product flow and premise management. The items in these variables follow exactly the MS1500:2009 requirement on the *toyyib* concept. For the third variable, which is waste management, the items are taken from the proposed best practice on Material Flow Cost Accounting (MFCA) issued by International Federation of Accountants (IFAC, 2005), with a guide from the MS1500:2009.

The questionnaire comprises of four sections; Section A on demographic profile, Section B on the optimum utilisation of resources, Section C on MS1500:2009 requirement on food processing and sanitation, and waste management, and Section D on the benefits of halal processing. The questionnaire includes questions about the implementation of stated items, as being proposed by MS1500:2009 and IFAC, in their company. A 5-point Likert scale is used in the questionnaire, ranging from 1 as strongly disagreed to 5 as strongly agreed. It is a self-administered questionnaire.

The descriptive analysis is employed to analyse the demographic profile as well as to assess the practices of EMA in halal processing and the benefits gained from halal processing. The important thing about descriptive statistics is that it would report a clear, specific and measurable condition in question (Grimes and Schulz, 2012). The spearman rho correlation is conducted to assess the relationship between halal processing and optimal use of resources.

Results and Discussion

During the data collection, more than 400 questionnaires were distributed but only 303 were returned and useable. The questionnaire distributed is not based on the company, but rather on the person in charge for halal in that company. Therefore, there are companies that filled more than one questionnaire as there are several people who are in charge for those companies, especially the multi-national companies.

A majority of the respondents (70.6%) are employees of a halal food company, while others are either the owner or key management of the company. 50.8% of respondents said their company has obtained halal certification for 5 years or less, 20.1% between 6 – 8 years and 29% more than 8 years. On the number of employees, 26.4% said they have 10 employees or less,

¹ Available at <http://www.daganghalal.com/>

² Refers to set of regulations, codes and guidelines to control the operational conditions within a foods producing establishment allowing for the production of safe food

38.6% have between 11 to 50 employees and 35% have more than 50 employees. A majority of the respondents (60.1%) said their company employed 100% Muslim, 33% employed more than 50% Muslim and 6.9% employed less than 50% Muslim. Meanwhile, a majority of the respondents (83.2%) are from private company (Sdn Bhd), 12.5% from unincorporated business (Enterprise) and 4.3% from other types of businesses. The demographic profile of respondents is tabulated as in Table 2.

Table 2: Demographic Profile of Respondents

	Frequency	Percent		Frequency	Percent
Position			Classification of Business		
Owner / Key Management	89	29.4%	Sdn Bhd	252	83.2%
Employee	214	70.6%	Enterprise	38	12.5%
			Other	13	4.3%
Years obtained halal certification			Having Environment Policy		
5 years and below	154	50.8%	Yes	282	93.1%
6 - 8 years	61	20.1%	No	21	6.9%
More than 8 years	88	29.0%			
Number of Employees			Environment Protection		
10 employees and below	80	26.4%	Yes	293	96.7%
11 - 50 employees	117	38.6%	No	4	1.3%
More than 50 employees	106	35.0%	Not Sure	6	2.0%
Percentage of Muslim Employees			Attended Halal Course		
100% Muslim	182	60.1%	Yes	209	69.0%
More than 50% Muslim	100	33.0%	No	94	31.0%
Less than 50% Muslim	21	6.9%			

The reliability of the data was verified using Cronbach's alpha, where the closer the Cronbach alpha is to 1, the higher the internal consistency reliability is (Sekaran, 2000). The alpha coefficients for this study are all above 0.80 and were concluded as being reliable (Nunnally, 1978). Table 1 presents the Cronbach's alpha coefficient for each factor.

Table 3: Reliability Statistics

	Cronbach's Alpha	N of Items
Optimum utilisation of resources	.829	6
Sanitation and Safety of Food Product (MS 1500:2009)	.965	7
Product Flow and Premise Management (MS 1500:2009)	.957	6
Waste Management	.961	8
Benefits from Halal Processing	.949	7

To answer the first research question, a descriptive analysis is conducted. The result is very encouraging. The respondents agreed that in processing halal food, they always use the resources effectively, and minimise wastage and pollution. The lowest mean is the use of water, which might indicate that Malaysians rely heavily on water for cleanliness. However, the mean is still high, which demonstrate the effective use of resources in processing is their priority. The result on the optimum utilisation of resources is tabulated in Table 4 as below:

Table 4: Optimum Utilisation of Resources

No	In processing halal food, the company always ensure	Mean	Median	Mode	Std. Deviation
1.	Minimise the use of water	3.6667	4.0000	4.00	1.02830
2.	Minimise the use of energy	3.9439	4.0000	4.00	.93505
3.	Minimise the use of toxic material	4.0792	4.0000	5.00	1.11001
4.	Minimise wastage of raw material	4.0627	4.0000	5.00	.97282
5.	Minimise soil pollution	4.0264	4.0000	5.00	1.07313
6.	Minimise water pollution	4.0990	4.0000	5.00	1.05327

On the (a) food sanitation and safety, and (b) product flow and premise management, the elements of MS1500:2009 are used as items to be asked to the respondents. Again, the result is very encouraging. Since the features of MS1500:2009 are used as the items in the questionnaire, the companies are very aware on the requirement and a majority of the respondents strongly agreed that their company's food processes strictly follows the requirements.

The halal food processing uses clean processing and equipment as being required. Contamination is avoided throughout the process. The sanitation facilities are adequate and well-maintained. The use of food additive is also at a minimal amount to

ensure the safety of foods. A majority of the respondents also strongly agreed that their company has designed the premise to facilitate the workflow in ensuring cleanliness. The premise is always clean and maintained regularly. The premise also cannot be entered by any pest species and any type of animals.

On the waste management, the features of MFCA with the guide of MS1500:2009 and GMP were asked to the respondents. It is very reassuring to find out that the halal food processing is very cautious on their material usage and has a proper wastage management. Accordingly, the respondents strongly agreed that they know the source of material and understand in detail the usage of those materials. This is in line with the halal requirement on the traceability of material. The respondents also agreed that their company has a proper waste management system, including taking proper action on waste such as identifying the cause of waste, recording the waste, identifying the cost of waste and carrying out on-going improvement to reduce waste.

Therefore, for the first research question, it can be resolved that the halal food processing industry in Malaysia does practise the EMA, as some of the EMA features have been indirectly embedded in the Halal Standard. The detailed results are tabulated in Table 5.

Table 5: Descriptive Analysis on the Halal Food Processing and Features of EMA

No.		Mean	Median	Mode	Std. Deviation
Sanitation and Safety of Food Product (MS 1500:2009)					
1.	Clean processing equipment in accordance with standards	4.4785	5.0000	5.00	.76689
2.	Processed products are clean as outlined	4.4587	5.0000	5.00	.69823
3.	The products flow in each process it not contaminated	4.4389	5.0000	5.00	.80277
4.	Sanitation facilities are sufficient	4.4191	5.0000	5.00	.76290
5.	Well-maintained sanitation facilities	4.4884	5.0000	5.00	.69936
6.	Food processing at the avoid of any contamination by foreign substances	4.5512	5.0000	5.00	.69758
7.	The use of permitted food additive in food processing is minimal	4.5578	5.0000	5.00	.73858
Product Flow and Premise Management (MS 1500:2009)					
1.	Premise layout is suitable for a good workflow	4.5347	5.0000	5.00	.80845
2.	The premise is designed to facilitate supervision of hygiene	4.5050	5.0000	5.00	.78425
3.	The premise is always clean	4.5644	5.0000	5.00	.68690
4.	Premise is maintained regularly to clean	4.5743	5.0000	5.00	.65630
5.	No pest species can enter	4.5149	5.0000	5.00	.70402
6.	Premise is not entered by all types of animals	4.5347	5.0000	5.00	.78349
Waste Management					
1.	Knowing the source of the raw materials used	4.5083	5.0000	5.00	.74079
2.	Understand in detail the use of raw materials in every phase of processing	4.5281	5.0000	5.00	.68453
3.	Identify the wasted raw material as a result of the process	4.4587	5.0000	5.00	.72613
4.	Has a structured system for disposal of waste	4.4686	5.0000	5.00	.74017
5.	Identify the cause waste in processing	4.4290	5.0000	5.00	.72382
6.	Record the waste	4.3894	5.0000	5.00	.78489
7.	Counting losses from the waste	4.4752	5.0000	5.00	.77109
8.	Take measures to reduce waste on an ongoing basis	4.4059	5.0000	5.00	.79124

The analysis for the second research question shows that there are significant relationships between all the independent variables with the dependent variables. Therefore, all the hypotheses are accepted as there are significant relationships between the (a) food sanitation and safety, (b) product flow and premise management, and (c) waste management with optimum utilisation of resources in halal Food Industries. The result of spearman's rho correlation is shown in Table 6.

Table 6: Spearman's rho Correlations

	Optimum Utilisation of resources	Food sanitation and safety	Product flow and premise management	Waste management
Correlation Coefficient	1.000	.318**	.306**	.263**
Sig. (2-tailed)	.	.000	.000	.000
N	303	303	303	303

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

The last objective is to examine how the food industry benefits from halal processing practice. Descriptive analysis was conducted and the result is also very encouraging. All the respondents agreed that halal processing makes their products, premise and workers cleaner. Moreover, they also agreed that halal processing is more effective, brings savings in processing and long-term benefits from the savings. Furthermore, halal processing can prevent the company from being sued because of impurities. The result of benefits from halal processing is shown as in Table 7.

Table 7: Benefits from Halal Processing

No.	Benefits from Halal Processing	Mean	Median	Mode	Std. Deviation
1.	Makes the products cleaner	4.5347	5.0000	5.00	.66955
2.	Makes the premise cleaner	4.4818	5.0000	5.00	.71328
3.	Makes the workers cleaner	4.5017	5.0000	5.00	.68510
4.	Results in more effective product processing	4.4653	5.0000	5.00	.68423
5.	Brings savings in processing	4.1551	4.0000	4.00	.91295
6.	Brings long-term benefits of the savings results	4.3201	4.0000	5.00	.80960
7.	Prevents lawsuits because of impurities	4.4290	5.0000	5.00	.87690

Conclusions

This study reveals that halal food processing has embedded some of EMA features in their processing. The basic concepts of food in Islam are halal and *toyyib*, which emphasises on pure food, starting from the source of the food until it has become consumable. Thus, halal is a universal notion about good food, produces through a good processing system.

The finding of this study is very encouraging. In processing halal food as required by the MS1500:2009, the food producers have practiced the EMA. The industry always ensures that they are optimally utilising their resources. The correlation study shows that there are significant relationships between the (a) food sanitation and safety, (b) product flow and premise management, and (c) waste management, with optimum utilisation of resources in Halal Food Industries. The halal food producers also admitted that they earned benefits by following the halal procedure through a good hygienic system in the process and saves from the waste management.

Although the EMA practices in halal processing are not comprehensive, the features embedded might become a starting point for a more holistic implementation. Therefore, it is suggested that a thorough study on halal processing is done to introduce the cost management system in halal processing. This would take halal processing one step further in effectively utilising their resources. This finding supports the notion that halal food is beyond the Muslim food issue. The emphasis on effectively use of resources and hygienic food processing should be applied to all food industries. Therefore, halal is not only about good food, but also about the optimal use of resources. The belief that halal is only Muslim food must be changed as halal indicates good food to be consumed by all human processes through a very good system.

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