Towards a Halal HACCP: An Analytical Study of HACCP in the Light of Shariah Rulings

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Abstract

Halal is a broadly defined term in Islam. This applies not only to food and beverages but also to medicine, cosmetics, business, tourism and all aspects of life. Allah SWT has preserved all his authority. Based on the Islamic theory regarding halal and haram, this principle has been described in the Holy Quran that all bad things, i.e. impure and undesirable things, are forbidden and all pure, delicious and good things are halal. This principle is explained in the Holy Qur'an with the importance that all people are addressed as such; O people eat that which is legal and clean in the earth. Modern technology has not only created many facilities for humanity today, but it has also opened the door to many problems and difficulties. Multinational companies are on the cutting edge of delivering their products to the world because of their wealth and expertise. Consequently, it is necessary to create standards that have strict requirements concerning halal and haram. The importance of safe and healthy food can be estimated from the World Health Organization report that 1.8 million people die each year from poor, unsanitary food. At present, various food safety standards are in place internationally. One of which is hazard analysis and critical control points. The following objective is discussed in this article: to analyze the HACCP rules in terms of halal certification and standardization. In short, HACCP plays a major role in the economy of a country. Having the Halal logo on the HACCP product will make it preferable.
Keywords: HACCP, Standards, Analysis, Food Safety, Halal HACCP, Packaging

Introduction:

In the life of Muslims, getting halal food and avoiding Haram is very important. The norms of Halal and Haram are set by Allah SWT and Muslims are strictly instructed to follow them. But we also find that demand for halal food is growing among non-Muslims as well. Indeed, the halal food standards set out in the *Shari'a* are the best hygiene standards to date. And it fulfills

every aspect. They provide guidance on each step from food selection to delivery to the consumer. In view of the importance of eating halal and avoiding haram in Sharia, it is the religious duty of a Muslim to research what is halal and haram in what he is consuming.

This principle is explained in the Holy Qur'an with the significance that all people are addressed as such, O people; eat what is legitimate and pure in the earth.[1]

Somewhere specially addressed to the believers such as; O you who have believed, eat of the pure things which we have given you, and give thanks to Allah, if you only Him do you worship.[2] And not only this but in one place, it was stated in the duties of our Prophet SAW, that who makes pure things lawful for them and impure things forbidden for them.[3] The things which are prohibited in Islamic law are clearly mentioned in the Quran; Forbidden to you are flesh, and blood, and the flesh of swine, and that upon which the name of other than Allah is invoked.[4] In the religion of Islam, there are limitations and restrictions on food which are mentioned in the Qur'an and the Hadith. Muslims only use halal food because at the global level ¼ are Muslims. Clean, safe food for a healthy lifestyle has always been a human priority. No one can deny the importance of good, hygienic food in achieving a healthy lifestyle.[5]

Food security is a general term used to describe the actions taken to ensure the safety of food provided to humans in order to protect their health.[6] In this article, we shed light on the importance of HACCP which ensures food quality. It must be closely monitored to protect consumers from serious food poisoning and foodborne illness. To sum up, all the precautionary measures referred for food safety must be addressed.

As for as concerned to the literature review, some content is required related to halal certification and halal standardization. Nevertheless, no research work under this title has been noticed so far. So it is an innovative research work of its kind. However, the following articles and handbooks are partially related which provides guidance. Here is some literature 'Halal Certification in The Light of The Shari'ah' by Syed Arif Ali Shah, 'Legislation of food products and issuance of halal certificate' by Fiqh Academy India and 'Halal food production' by Mian Riaz Muhammad.

Importance of food safety on an industrial scale:

The need for food safety has increased when food safety hazards and problems, such as food spoilage during transportation, have been encountered in reaching the consumer after the food has been prepared. In order to avoid these problems, different procedures and standards have been drawn up at individual, national and international levels. Following this, certain standards were used for "Infrastructure for Food Security". At present, various food safety standards are in place internationally. One of those is risk analysis and critical control.[7] In recognition of this need, halal standards have been incorporated into all internationally agreed standards. The purpose of this document is to provide an analysis of HACCP (Hazard Analysis Critical Point).

Introduction of HACCP:

This standard provides a system of food safety that is internationally recognized and deviates from traditional methods of food safety testing and relies on safety and health at the outset rather than on the basis of past experience or personal judgment. Helps ensure safe food is prepared.[8] This system identifies all potential threats to international trade related to food security. It also identifies when these hazards may enter, damage, contaminate and affect food safety. Currently, these food hazards can be prevented by implementing a control system.[9]

Two Major Components of HACCP:

There are two major components of HACCP

i. **Hazard Analysis:** This component determines where and what type of hygienic hazard exists.

ii. **Critical Control Point:** These are the critical control points that control the production process, ensure food security, and are used to identify and prevent hazards.[10]

➢ **Principles of HACCP:**

- Classify the potential hazards associated with food production at all stages
- Define the points, procedures and operational steps that can be controlled to eliminate the hazards
- Establish critical limits, which must be met to ensure that the CCPs (Critical Control Points) are under control
- Create a system to monitor control of CCPs by scheduled testing or observations
- Establish the corrective action to be taken, when monitoring indicates that a particular CCP is not under control
- Establish procedure for verification
- Establish certification concerning all procedures and records

➢ **Rules and Regulations of HACCP:** It has the following seven rules.[11]

1. **Hazard Analysis:** Any kind of mixture in food which later causes illness is called hazard. Similarly, hazards are things or substances that spoil food or its ingredients and cause harm to the consumer after consumption. There are four types of food safety hazards: natural, chemical, biological and allergenic.

2. **Identify Critical Control points:** The point during food preparation when a hazard is introduced into the food can be controlled to prevent the hazard from entering the food or to reduce it to a desired level. Or it can be reduced to the required amount. These are steps taken at the plant that need to be closely monitored to ensure food safety.[12]

3. **Establish critical limits:** Hazard is controlled by these limits. To check when the critical control point, CCP is going out of bounds. For example, when storing meat, the temperature range of the store room is kept between -20 and 0 degrees Celsius.

4. **Monitoring critical control points:** After the CCPs and limits are determined; a system of checks and balances is devised on each CCP to see how well the CCPs are being implemented. Tests are usually performed by monitoring temperature and time. [13]

5. **Establish corrective actions:** When the control system indicates that the control is not within the desired limits, corrective actions will be

taken to ensure the safety of the food. For example, if the testing system indicates that it is rising above 0 degrees and if this is due to any malfunction in the refrigerator, then the food will be discarded and the refrigerator will be replaced or repaired.

6. **Verification:** The HACCP system shall be periodically reviewed and if any improvements or changes are made to the procedure, it shall be ensured that the required limits are being achieved.[14]

7. **Record Keeping:** For the successful implementation of HACCP system, it is necessary to keep all kinds of records. Without records, the application of HACCP becomes uncertain. Record your control system, critical limits, testing system in written form on a daily basis. The complexity of the record varies depending on the nature of the business. The objective is to ensure that control is being maintained. The following chart summarizes all of the above steps and procedures.

Features	Descriptions
Preliminary Steps	• Assemble HACCP Team • Describe Product • Identify Intended Use • Construct Flow Diagram • Verify Flow Diagram on-site
Principles of HACCP	• Conduct Hazard Analysis • Determine CCPs • Establish Critical Limits for each CCP • Establish Monitoring system for each CCP • Establish Corrective Action • Establish Verification Procedures • Establish Documentation and Record keeping

➤ **Characteristics of HACCP:**

• It eliminates problems from the beginning.

• The system has a number of control systems that help prevent or minimize hazards.

- HACCP makes prepared food safe to eat at the manufacturing stage instead of testing it in laboratories, eliminating the need for laboratory testing of food. Due to which there is no need to test the food in the laboratory.

- This system uses science and technology to ensure the production of healthy and safe food.

- This system covers all types of food safety hazards whether they are naturally occurring in food, added due to environmental influences or caused by an error by the food manufacturer.

- This system provides a complete process to ensure that food is prepared safely.

- This system focuses on food safety at all stages of food production.

- This system makes improvements to enhance food safety.[15]

Importance of Halal Food Industry:

As demand for halal food also lies among Muslims and non-Muslims, and its demand is increasing steadily. In this context, the halal food industry is globally established and its market value is growing daily. Halal food industries exist in Muslim and non-Muslim countries that deal with halal food. There are approximately 2.5 billion Muslim people in the world. Most of them are non-Muslims where the availability of halal food is a major issue. Against this backdrop, the importance of the halal food industry is growing. The industry plays a key role in bringing halal food to non-Muslim countries. In parallel, the demand increases among non-Muslims. According to a 2017 report, the global market value for halal food was US$1.4 trillion, rising to US$2.6 trillion by 2023.[16]

Comparison of Halal Food Standard and HACCP

> **Gradual Procedure of Halal System**

- **Team building:** First, a team is formed, which includes experienced, skilled, educated, competent and hardworking people to oversee every step that occurs during the production and transfer of the halal product. They include religious scholars, food technologists, lawyers, etc.

- **Issuance of Halal Product Declaration:** Halal includes things and measures related to every aspect of life except food. Therefore, the Halal certification body will state in its statement what kind of product it will issue Halal certification for. For example, if the Accreditation Council[17] allows a certification body to issue certificates only for Halal meat, it will not issue certificates for other Halal-related items.

- **Issuing the definition of Halal:** The certification body will make it clear in terms of its product from which jurisprudence it has taken the definition of halal, because there are differences in the halal, haram, and Makruh of certain things and types of animals that are halal in different school of thoughts.

- **Scheduling all stages of product manufacturing:** In this step, all the steps involved in the production of the product are drawn up. Take the example of the slaughter house, from the arrival of the animals, processing, packaging and delivery, all the steps are sequentially noted in the form of a diagram.

- **Inspection:** The team of the Halal certification body reaches the place of production of the product and reviews all the processes and compares it with their blueprint. Then, if any changes are required, they are informed to the company. The certificate is issued only after the desired results are achieved.

Principles and Regulations of Halal HACCP

1. **Hazard Analysis:** All ingredients required for the desired product must be halal or made from halal and must not contain any haram, alcohol or gelatin additives. Natural, chemical, biological and allergenic hazards are also present here. HACCP principles will be applied.

2. **Identify Halal Control Point:** Special care shall be taken during the manufacture of the required product to ensure that no haram material or haram method is adopted in them. In the example of meat, the method of slaughtering the animal, whether the slaughterer is a Muslim or a person of the book, when slaughtering the animal is facing the

Qiblah, the knife should be sharp, the name of Allah (Takbir) should be recited while slaughtering, the place should be free from impurity. Yes, the storage area should be clean, not mixed with haram meat, etc. The following chart outlines the locations where halal control points can be installed in the slaughter house.[18]

3. **Establish Halal Limits:** As with the system, we identify physical, chemical and biological hazards; in the halal food industry, we identify potential religious hazards. There are two types of religious hazards that can occur. Intolerable and tolerable. Intolerable: Possible risks where slaughter or processing steps are intolerable if they conflict with the requirements of Sharia law. They are determined by consensus among Muslim scholars. Examples of these are pork meat, fat, or any other part, the presence of blood in the finished product, the absence of acceptable religious cleanliness of the reproductive line, the ritualization by which the animal is slaughtered.[19]

4. **Monitoring Halal Control Points:** Control points will be set up at these stages to see if halal procedures are being followed or not. In most stages it will be a team that will monitor all stages. This team will include religious scholars, jurists, chemists, etc. Temperature sensors will be installed during storage. They will inform us if the temperature is too low or too high. Because in both cases, the quality of the meat may deteriorate and it may not be usable and may fall into the category of haram due to non-compliance with hygiene rules.

5. **Establishing Corrective Actions regarding Halal:** If the control system shows us any error, then it is corrected. For example, if the control system tells us that the animals brought in are sick and unhealthy, they will not be used. Or if the temperature is getting low/high. If so, it will be fixed.

6. **Establishing Verification Procedures regarding Halal:** If any new process/ingredient/machine is being introduced then first we will check whether it meets the permissible and unacceptable conditions as per our halal calculation if yes then it is used otherwise not.

7. **Record Keeping:** All the steps are recorded and any new changes are also recorded so that it can be useful during the survey of a government team or when issuing halal certification.

Table:

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                    ┌─────────────────────────┐
                    │     Acceptable Birds     │
                    └─────────────────────────┘
                                 │
                                 ▼
              ┌────────────────────────────────────┐
              │  Holding Under Humane Conditions    │
              └────────────────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │         Stunning         │
                    └─────────────────────────┘
                                 │
                                 ▼
   ┌──────────────────┐   ┌─────────────────────────┐
   │ Muslim Slaughter │◄──│       Sharp Knife        │
   │       man        │   └─────────────────────────┘
   └──────────────────┘              │
                                      ▼
                    ┌─────────────────────────┐
                    │        Invocation        │
                    └─────────────────────────┘
                                 │
                                 ▼
   ┌───────────────────────────────────────────────────────────┐
   │ Slaughtered in the Neck from the front side cutting all    │
   │                        Passages                            │
   └───────────────────────────────────────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │  Post Slaying Treatment  │
                    └─────────────────────────┘
                                 │
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         ┌─────────────────────────┐        ┌──────────────────────┐
         │     Halal Carcasses      │───────▶│ Feathers and Organs  │
         └─────────────────────────┘        └──────────────────────┘
              │                    │
              ▼                    ▼
     ┌──────────────┐      ┌──────────────┐      ┌──────────────────┐
     │ Whole Birds  │      │   Deboning    │─────▶│  Bones and Skin  │
     └──────────────┘      └──────────────┘      └──────────────────┘
              │                    │
              │                    ▼
              │            ┌──────────────┐
              │            │  Meat Cuts   │
              │            └──────────────┘
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   ┌───────────────────────┐
   │ Packaging and Labeling │
   └───────────────────────┘
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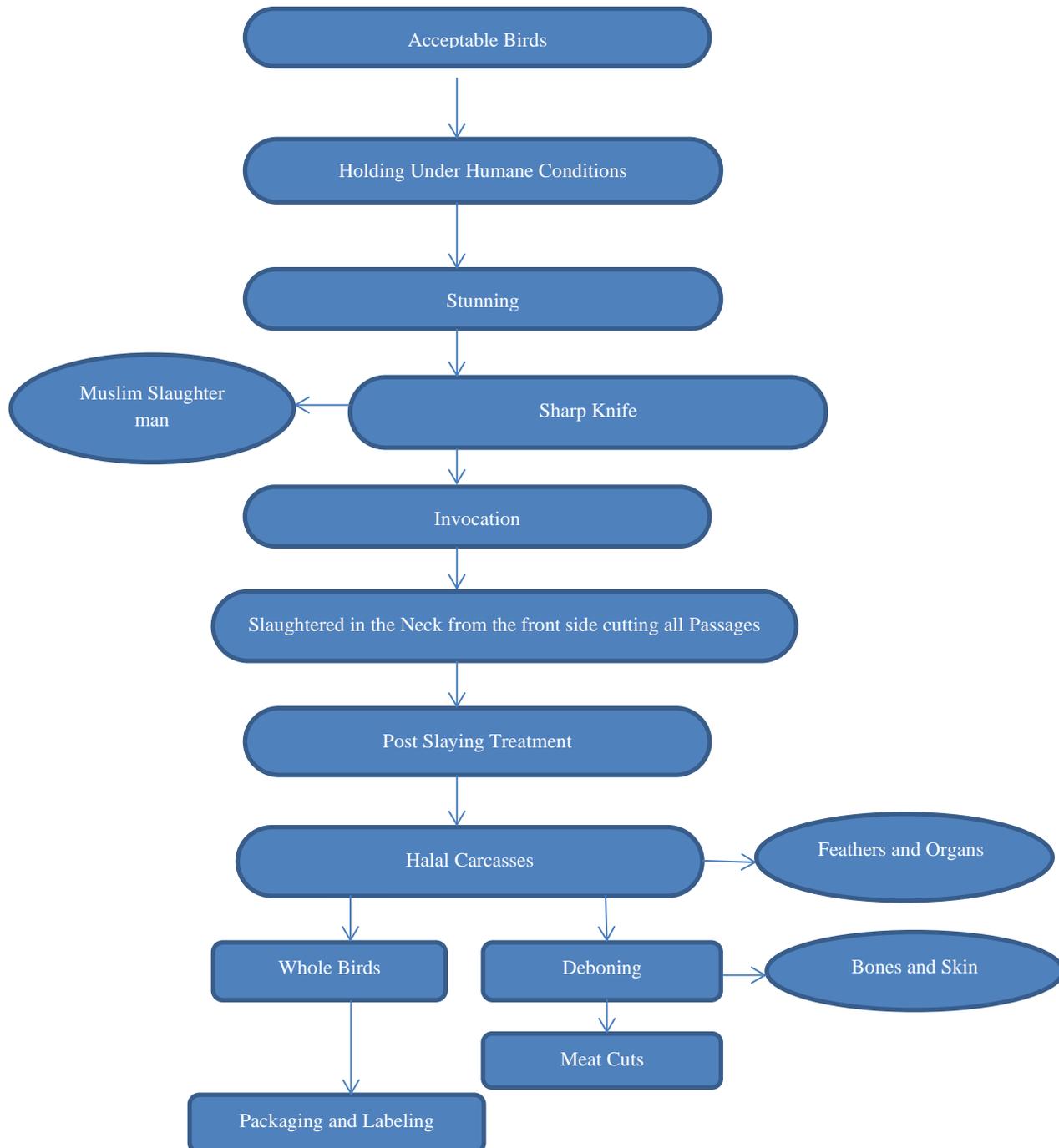
How HACCP Works --------- The 12 Codex Steps

1. Assemble HACCP Team

2. Describe Product

3. Identify Intended Use

4. Construct Flow Diagram

5. On-Site Confirmation of Flow Diagram

6. List Hazard, Conduct Hazard Analysis, Consider Control Measure

7. Determine Critical Control Point

8. Establish Critical Limits for CCPs

9. Establish Monitoring System for CCPs

10. Establish Corrective Actions

11. Establish Verification Procedure

12. Establish Documentation and Record Keeping

➢ **Compatibility between HACCP and Halal HACCP**

- The main objective of both is the availability of healthy and safe food to the consumer. For this, healthy animals are medically examined before slaughter. In case of imperfections, the animal is rejected.

- Both ensure that unhealthy ingredients are not added to the feed. For this reason, the use of antibiotics in animals is stopped before slaughter

because their residues remain in the meat for a long time, which can be harmful to human health.

- In both, food safety is ensured during food preparation and every stage is critically checked by installing control points. As a doctor performs a medical examination of animals before slaughter, Traceability of the animals is also checked. This means the complete record of the animals from birth to slaughter, who were their parents, what farm they were raised on, and what was their diet.

- In both, non-standard procedures are avoided. All the staff in the Slaughterhouse is experts in their work. Everything is up to the standard the temperature, humidity, and air circulation of the storeroom for storing the meat after slaughter is necessary.

- In both systems each procedure is first explained thoroughly and then the prescribed procedure is followed. For which all the steps are diagrammed on a chart. This outline is made keeping in mind every aspect and it is pasted in the plant. Adherence to these SOPs is ensured and no compromise is made on them.

- Inspection or monitoring process is mandatory in both. For example, the animal is medically examined before slaughtering. Similarly, after skinning, the doctor examines all the soft organs of the body (liver, lungs, kidneys, etc.) and those that do not meet the standards are cut and discarded.

- In both procedures, the limits of each stage are laid down, within which the work has to be carried out. It has to arrange the hygiene of the machinery as well as the individual hygiene of the workers.

- Both have procedures in place to prevent food spoilage after it is prepared to prevent the finished food from being wasted. For example, while transporting meat, temperature-controlled vehicles are used, in which standard temperature store rooms are provided.

➢ **Comparison between HACCP and Halal HACCP**

HACCP	HALAL HACCP
HACCP is a man-made system that began after World War II.	Whereas the Halal system is derived from divine sources.
HACCP system is not for halal and haram control points of this system, it is not considered mandatory that the slaughtered animal is halal or haram.	Whereas in the Halal system, the first thing that is seen is whether the animal being slaughtered is Halal or not.
The HACCP system is made keeping in mind the physical hazards (Physical, Chemical, and Biological hazards.	While the system of halal takes into consideration the physical risks as well as the spiritual risks (the advice of the Prophet, peace and blessings be upon him, is that one who eats a morsel of haram, his prayers and supplications will not be accepted for forty days.[20]
The HACCP system does not impose any conditions on animal feed.	While in the Halal system, it is arranged that the animal that is being slaughtered is not given such food that contains impure meat (pigs) etc. That is, the Halal system is Farm to Fork is a practical picture.
HACCP does not provide guidance on which to choose among different types of products that are being used for the same purpose.	Whereas in halal there is a lot of emphasis on product selection.

Halal Control Points:

Similarly, the halal control points that will be installed in the halal system, which are not given importance in the HACCP system, are: Halal animals will not be slaughtered in the place where forbidden animals are being slaughtered. The slaughter of a halal slaughterer should be physically separated from that of a non-halal slaughterer, i.e. there should be no mixing that would transfer its impure effects to it. Slaughter equipment should only be used for halal slaughter.

i.   The animal being slaughtered should be alive at the time of slaughter.

ii.   *Zabih* (Slaughterer) must be a Muslim, familiar with halal slaughter according to Islam. He must not be from the believers of another sacred Book.

iii.   Before slaughtering, mention the name of Allah and do not have any other intention here.

iv.   Halkoum (the tip of the throat that appears to be present in the neck; throat), Murrai (trachea) and Vidjan (jugular vein) should be cut so that the blood flows quickly and the animal dies.

v.   The halal control point regarding machine slaughter is that if the machine is such that the animal is slaughtered from the side of the neck and not from the neck and the operator of the machine is a Muslim and he starts (on) the machine by reciting *Tasmiyah* once. If given, then the number of animals slaughtered will be considered halal until the machine is stopped, as one discharge may be sufficient due to the flow of electricity[21].

HACCP does not prohibit anything that is not scientifically proven to be harmful to health, but it has been proven that many things that are prohibited in Shariah are prohibited. They were not prohibited in HACCP and later when they were proven to be harmful to health, they were declared as hazardous to food. In this way, Sharia laws prove their supremacy over HACCP.HACCP system plays a major role in the economy of countries. Having the Halal logo on the HACCP product will make it preferable.[22]

Results:

- HACCP is a system used worldwide to ensure food safety. It provides much of the food security, which is why it's the basic structure of food security laws in different countries. They also use this system to promote their tourism programs.

- But HACCP rules and regulations alone are inadequate and incomplete as far as food safety is concerned unless they include halal rules and regulations. HALAL HACCP provides complete food security and safety.

- In the standard halal and halal certification process, if a specific halal checkpoint is put in place, the practical theory of *"Halala'n Tayyaba'n"*

will be identified. Demand for halal food is increasing amongst Muslims and non-Muslims.

Recommendations:

Accordingly, it is necessary to introduce the principles and procedures of halal HACCP through training programs and to implement them at the international, national and individual levels. In summary, the halal HACCP system should be implemented in all instances and at all levels.

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[12]. For example, the supply of animals to the slaughterhouse, meat processing, packaging, labelling, storage, and transportation measures will be monitored and it will be seen which point in the above can be controlled. Risk can be eliminated.

[13]. For example, when storing meat, if the temperature is outside the specified limits, the control will report it.

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