

A Decision Tree Based Approach for the Identification of Halal Critical Control Point for Slaughtering According to Islamic Dietary Law

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Abstract

The decision tree approach established based on MS 1500:2009 for halal slaughtering. It will assist those applying Halal slaughtering in the slaughter house by determine the Halal critical control point. Besides it is a guide to the decision problem and a useful technique for determine and control the needs to assure halal slaughtering. It is a holistic and systematic way and structured with a view to achieve sustainable practice. This paper offers simple and easy guide to implement Islamic dietary law requirement for Zabiha (halal) meat.

Key words: Decision tree, Halal Critical Control Point, Islamic dietary law

Introduction

Islam is a way of life and provides guidance on all aspects of life for Muslims. Shariah Law – defined as an Islamic law based on the Al-Quran, Al-hadith (Traditions of the Messenger of Allah), Ijma (Consensus of Islamic Scholars) and Qiyas (Legal Deduction or Analogy) according to the Shafei or anyone of the Hanafi, Maliki or Hanbali Schools of Thought which have been practiced by countries where these guidelines have been implemented. The basic principles of the Islamic laws remain definite and unchanged. However, their interpretation and application may change according to the time, place, and circumstances. In the rearmost case, the process of Ijtihad, or exerting oneself fully to derive and answer to the problem, is used (Regenstein et al. 2003). Muslims pursue Islamic dietary laws in order to follow the Divine Orders.

In Syariah Law, halal means lawful as pertaining to food and other products for human consumption and services permitted. On the other hand haram defined as unlawful as pertaining to food, beverage and other products not allowed for human consumption such as carrion, najis (filth), intoxicating preparation containing alcohol as well services prohibited under the Shariah Law because it cause harm and illness (Al-Ghazali, n.d, 2: 655 and 820). To preserve the health of man and also to comply Islamic

Law, the doctrines of lawful and unlawful are important (Nurdeng, 2009).

Islamic Dietary laws permit consumption of meat of permissible animal provided it is slaughtered in accordance with the prescribed method. Ritual slaughter is an act of slaughter carried out according to the religious requirements of Muslim religious faith. Halal requires that the halal animal to be humanely killed by an adult Muslim. Besides the method of slaughtering, halal also govern by cleanliness, safety, preparation and storage. The Malaysia Standard MS 1500:2009, Halal Food – Production, preparation, Handling and storage- General guidelines (2nd Revision) have stated that halal food need to be processed, packed and distributed in accordance of MS 1480, Hazard Analysis Critical Control Point (HACCP) or MS 1514, Good manufacturing Practice for food (GMP). MS 1500:2009 also clearly defined the important of halal slaughter meat to be HACCP regulated to achieve both food safety and principles of humane slaughter while ensuring that the religious process is not compromised.

HACCP allows and support systematic examination of all the steps involved in the preparation and product as well as identification of the steps that are critical to the safety of product (Mayes, 1992). To eliminate the presence *Salmonella*, *Campylobacter jejuni*, *E.coli* and other spoilage microorganisms it is necessary to maintain strict hygiene administration and implement the HACCP concept (Simonsen et al, 1985; Arvanitoyannis et al, 2009). Furthermore, widespread adoption of Hazard Analysis

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Critical Control Point (HACCP) by the meat and poultry industry intend to enhance consumer confidence in its products and reduce the currently existing barriers in international trade. Similarly, halal food equally requires consumer confident, credibility and worldwide acceptability. This paper outlines a simple guide to identify the Halal critical control points with the application of HACCP concept in religious slaughtering. Control and monitoring will assure that the dietary laws are not compromised and able to detect and eliminate the non-conformity from the slaughtering activity. The Halal slaughter decision tree is not a definitive guide but an introduction for integration.

Material and Methods

MS 1500:2009 Halal Food – Production, preparation, Handling and storage- General guidelines (2nd Revision) was applied to construct decision tree for slaughtering (MS1500, 2009). The special requirements for slaughtering as listed below were followed.

- An animal must be of a halal species and a live
- It must be slaughtered by an adult and sane Muslim
- The name of Allah must be pronounced at the time of slaughter
- Slaughter must be done by cutting the throat in a manner that induces rapid and complete bleeding, resulting in the quickest death; the generally accepted method is to cut at least three of the four passages, i.e., carotids, jugulars, trachea and esophagus
- Prohibition of blood

The HACCP concept is the backbone structure to identify the compliance and hazards associated with the steps, determine the CCP and determine specific criteria to indicate whether an operation is under control, establish and implementation of procedures to monitor CCP, identify corrective action when CCP out of control and lastly verify the whole system (Mayes, 1992). In this study, replaced with Halal Critical control points (HCCP) used identify and eliminate potential presence of HARAM which is zero tolerance in Islamic dietary law. Appointed Muslim Halal executive offer shall use the guide (Figure 1) to identify HCCP.

Results and Discussion

To determine the compliance, each questions in the Halal critical control point decision tree for slaughtering need to be answered.

Question 1. Is the animal from an acceptable halal species?

Generally pig and dogs their descendents (*najs al-mughallazah*) are unlawful. The meat of pigs, boars, and swine is strictly prohibited. Swine serves as a vector for pathogenic worms to enter the human body. Infections by parasites like *Trichinella spiralis* and *Traenia solium* are not uncommon (Gulam, 1982). Furthermore researches also have added that incompatibility of pork fat, fatty acid composition with human being fat and biochemical system (Awan, 1988; Hussaini and Sakr, 1983; Sakr, 1991) Animals with long pointed teeth or tusk which are the carnivorous animals such as lions, tigers, cheetahs, cats, dogs, monkey and wolves are prohibited. Besides that, birds of prey such as eagles, falcons, osprey, kites, and vultures and pests and or poisonous animals such as rats, cockroaches, centipedes, scorpions, snakes, wasps are not halal species. Other animals like donkeys and mules too fall in the category of animal forbidden to be eaten according Shariah law. Furthermore farmed animal which are intentionally and continually fed with *najs* (filth) is not allowed to be slaughter and consider Haram.

The domesticated animals like ruminants with split hooves (cattle, sheep, goat, or lamb, for example) is allowed for food, as are camels and buffaloes. Also permitted are the birds that do not use their claws to hold down food, such as chickens, turkeys, ducks, geese, pigeons, doves, partridges, quails, sparrows, emus, and ostriches.

Once the halal animal identified, should assume the ‘yes’ response and move to second question. If the answer is ‘No’ than it is HCCP. The first step needs to be rectified immediately.

Question 2. Are the animals being hold under humane condition?

Understanding of stress and physical injuries that occur before and during transport to slaughter, during handling at livestock markets, and at the time animals are put-up for slaughter within abattoirs is extremely important. Stress in animal during transfer to the slaughtering point within the abattoir has important effects on meat quality, and there is growing evidence that strenuous exercise or CO₂ stunning can contribute to oxidative rancidity in meat, poultry and fish (Gregory, 2008). Besides that Islam places great emphasis on gentle and humane treatment of animals, specifically before and during slaughter. Some of the humane treatment conditions include giving the animal proper rest and water, avoiding environment that create stress (Regenstein *et al.* 2003, Riaz and Chaudry, 2004).

Slaughtering one animal in front of next in line animal is against the humaneness slaughter regulation. Riaz and Chaudry (2004) also have clearly defined the pre slaughtering condition for ruminant and poultry and strictly forbidden on any ill treatment, acts that cause stress or fear like beating, injury or cutting prior their slaughtering. If the answer is ‘Yes’ then the need to proceed to question 3. While answer ‘No’ is responded, the animal need to be treated or unable to slaughter.

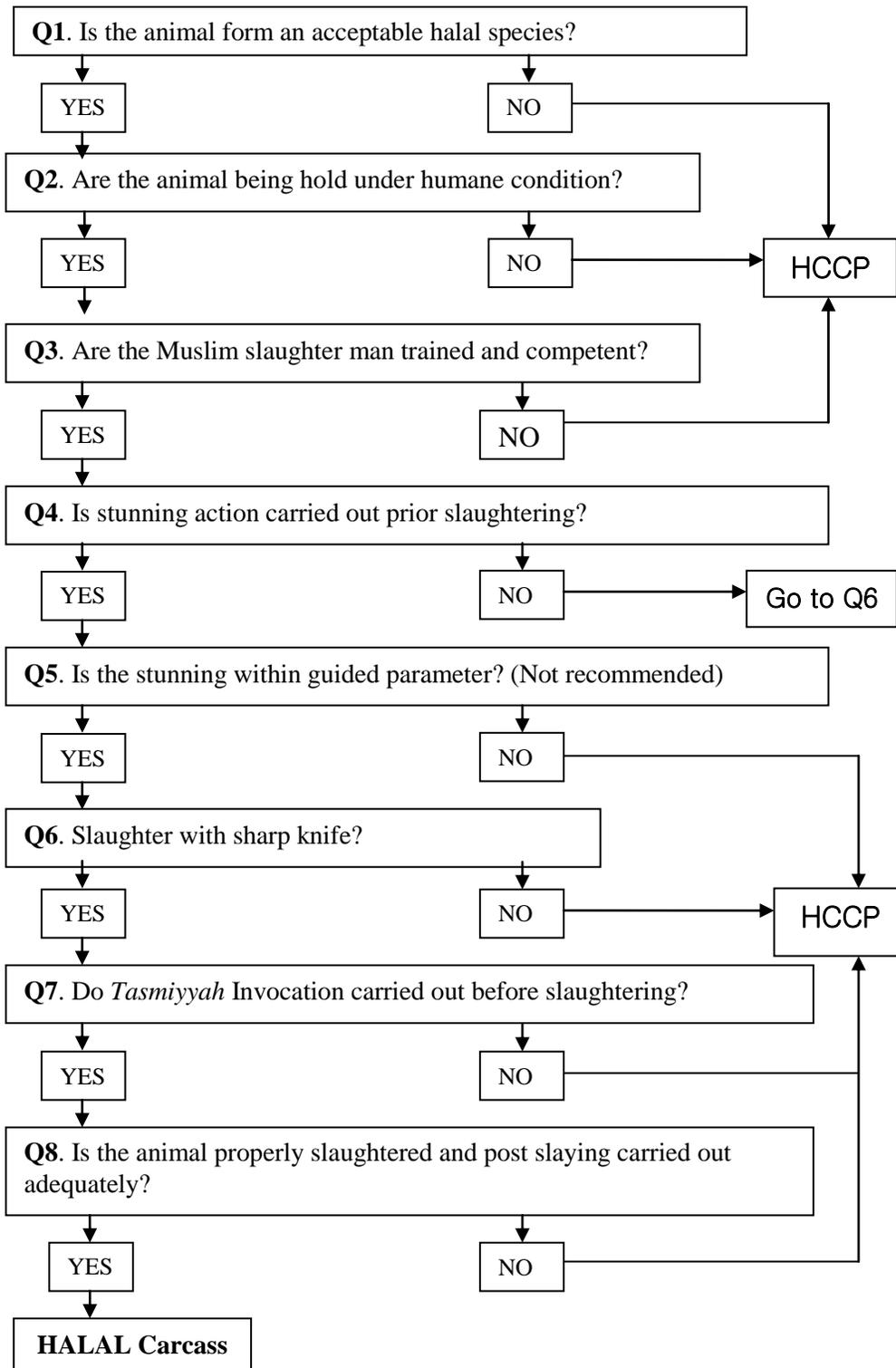


Figure 1. Halal Critical Control Point Decision Tree for Slaughtering farmed animal

Question 3. Are the Muslim slaughter man and inspector trained and competent?

Any Muslim assuming to these roles must be educated on Shariah law and have experience in proper halal slaughtering practices and procedures. A practicing muslim who mentally sound, baligh, fully understand the fundamental rules and conditions related to the slaughter (Riaz and Chaudry, 2004). In Malaysia, all slaughterers must attend training and obtained certificate of slaughtering from state Islamic Religious Department or State Islamic Religious Council (Halal pages, 2010). The respective slaughter house Management need to assure they meet the requirements prior conducting halal slaughtering.

If the stunning is not carried out, move to question 6. Stunning is not recommended, however if stunning is to be carried out according to the specific.

Question 4. Is stunning action carried out prior slaughtering?

Generally stunning is not recommended, if used nonlethal methods of stunning, it may be used by meet the legal required as condition specified in Annex A in MS 1500:2009 for human slaughter condition. If answer 'Yes' move to question 5.

Question 5. Does the stunning within guided parameter?

The method used need to be reversible stunning and shall not kill or cause permanent physical injury to the animal. Besides that the person responsible for the stunning operation need to be trained in its use. The operation is required to be monitored, supervised and checked by Halal executive. The methods need to be verified and confirm according to the specification to ensure the stunning act will not kill the animal and poultry. Various stunning method have described and the parameters in Annex 1. The control limits need to be determined and the action need to be monitored and verified. Animals that are dead due to stunning procedure are identified as non-conformance and discarded.

Question 6. Slaughter with sharp knife?

The knife that is used to slaughter the throat and the carotid and jugular blood vessels must be razor sharp so that the animal does not feel pain. It also need to be without blemishes, damage, free from blood and other impurities (Gulam, 1982). This is to ensure a swift, smooth cut across the throat behind the jaw carried for once and to ensure immediate and maximum gush of blood (FAO, 2001). The sharp, swift single blow and gushing out of the blood triggers an anesthetic reaction in animals (Riaz and Chaudry, 2004).

A blunt knife will prolong the incision and the cut ends of the blood vessels will be damaged. This may cause premature clotting and blockage of the vessels, delaying bleeding out and prolonging the onset of unconsciousness and insensitivity. Poor bleeding or delayed bleeding will

result in an increase of blood pressure, and blood vessels will rupture, causing muscle haemorrhage (FAO, 2001). This extra blood in the tissue will cause the meat to decompose more quickly, resulting in waste of meat. If the knife is not sharp, slaughtering activity should not be continued.

Question 7. Do *Tasmiyyah* Invocation carried out before slaughtering?

Tasmiyyah has to be invoked immediately before slaughtering. It is mandatory to pronounce the name of God (BISMILLAH ALLAHUAKBAR or BISMILLAH) which means "in the name of Allah", and (BISMILLAHIRRAHMANIRRAHIM) which means "in the name of Allah, Most Gracious, Most Merciful). Allah (s.w.t) says in the al-*Qur'an*: "eat not (of meat) on which God's name has not been pronounced." (Al-An'am (6):121). If invocation not carried out it automatically become unlawful for consumption. Although different scholars have defined tasmiyyah various way, the tradition emphasizes that the pronouncing of God's name was widely known matter and essential condition of dhadh (Gulam, 1982).

Question 8. Is the animal properly slaughtered and post slaying carried out adequately?

It is only allowable to sever parts such as ears, horn, and legs before the animal is completely lifeless. Normally when the drain completely drain, the heart stops, and the animal is dead, one may start further acts of dressing the carcass. Followed by, removing the skin and internals before deboning is carried out in a manner that protects the safety of meat and quality preserved. The halal carcasses need to be stored in safe and conducive environment.

After completing these questions, the control procedures, limits, and monitoring systems for each HCCP must be established. Table 1 indicates how, in the example given.

The example of control procedure and monitoring system is only for a guide and shows how simply religious requirements can be outline with HACCP concept. It is very useful for slaughter houses to adopt and adapt HALAL slaughter requirements easily and at the same time can integrate with HACCP system. This to allow and assist the Halal executive to establish suitable and effective procedures and monitoring system to ensure the activities are carried out without compromising principles and if violation takes place, it can be immediately detected. Corrective action shall be taken and the system will be put in place by intensification.

Table 1: Examples of HCCP management

Question No	Halal Critical Control Point	Control Procedure	Monitoring system
1	HCCP 1	The Ruminant and poultry husbandry specification Pathology of animal Approve Veterinary drug Washing dirty animal	Husbandry Audit/ Inspection record Control of animal health documents Laboratory Analysis Report on disease from veterinary Health status Report of the holding of origin and the animal Cleaning record Water monthly microbiological and chemical control record
2	HCCP 2	Animal transportation Animal handling under humane condition Halal slaughter house	Transport monitoring Water and food checking Visual monitoring Halal certification
3	HCCP 3	Training and Assessment Personal Hygiene Practicing Muslim	Training Record Competency monitoring record Islamic department slaughter certificate
4	None	None	None
5	HCCP 4	Registered and licensed facility Stunning parameter Environment hygiene	Registration Document Stunning monitoring record Hourly cleaning checklist
6	HCCP 5	Knife Control	Knife sharpness and condition checking record
7	HCCP 6	Invocation guide	Invocation checklist
8	HCCP 7	Good Hygiene practice Equipment hygiene	Cleaning and Disinfection checklist

Conclusion

The decision tree for slaughtering is only a small part of the meat and meat product flow. The general concept of this study is to demonstrate that Food safety and halal can be integrated. However in this paper full focus was given to Islamic dietary law mainly slaughtering compare food safety. In short decision tree based approach for halal slaughtering will provide the responsible personal and management accurate practice and information for the halal religious slaughtering activity. Last but not least, the Halal executive must establish and use the information effectively, accurately and appropriately.

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