

Central Lancashire Online Knowledge (CLoK)

Title	The Variations in Religious and Legal Understandings on Halal Slaughter
Type	Article
URL	https://clock.uclan.ac.uk/id/eprint/20376/
DOI	https://doi.org/10.1108/bfj-03-2017-0129
Date	2018
Citation	Chandia, Mahmood and Soon, Jan Mei (2018) The Variations in Religious and Legal Understandings on Halal Slaughter. British Food Journal, 120 (3). pp. 714-730. ISSN 0007-070X
Creators	Chandia, Mahmood and Soon, Jan Mei

It is advisable to refer to the publisher's version if you intend to cite from the work.
<https://doi.org/10.1108/bfj-03-2017-0129>

For information about Research at UCLan please go to <http://www.uclan.ac.uk/research/>

All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the <http://clock.uclan.ac.uk/policies/>

The ~~Dynamics-Variations in~~ Religious and Legal Understandings ~~on~~ Halal Slaughter

Abstract

Purpose: This paper attempts to provide an overview of ~~in~~ different understandings regarding the concept of "what constitutes halal" and "who determines this concept?" In practice, this equates to contemporary legal understandings versus religious understandings. The paper further aims to provide an overview of competing Muslim understandings regarding the concept of "What does or does not constitute halal slaughter?" In practice, this equates to evaluating the application of no stunning at all upon an animal (unanimous acceptance) versus the application of reversible stunning upon an animal (contested).

Design: The study includes a review of priori literature and considers the current scenario of the halal poultry trade and raises important questions regarding Islamic dietary practices, halal food integrity, religious and animal welfare understandings. ~~This includes evaluating the ever-increasing demand for halal products and to what extent this demand can be addressed. Three key questions were raised: "To what extent does stunning impact halal slaughter?", 'Who determines what is halal slaughter?' and 'What are the variations and tensions between legal and religious understandings of halal slaughter?'~~

Findings: The examination of such requirements and concomitant consumer and provider expectations is underpinned by a study of an operational framework, i.e. industry practices with poultry (hand slaughter, stunning, mechanical slaughter, etc.), ethical values and market forces to appraise whether there is a point of convergence for these that can be beneficial for both seller and consumer concerns. This paper has considered different perspectives on the religious slaughter and provided an overview of competing understandings regarding the ~~above concepts. concept of "To what extent does stunning impact What constitutes halal slaughter?", 'Who determines what is halal this slaughterconcept?' and 'What are the dynamics variations and tensions between legal and religious understandings of halal slaughter?' and 'What are the implications for industry'.~~

Originality/value – This study although academic and philosophical in nature, ~~it~~ raises questions on route to suggesting future research directions. It provides real value in stimulating more research in the area of halal food production and contributes to the understanding of different slaughter requirements ~~for~~ religious slaughter and the meat industry. It further sheds light on not only the religious and secular legal frameworks on animal slaughter and welfare but also the variations in understanding between them and provides examples of attempts to bridge any gap. The paper highlights the importance of halal food based on religious values and its implications for wider society.

Keywords: halal; ~~integrity; market growth;~~ poultry; ~~reversible; slaughter; productivity;~~ stunning, [law, industry practices](#)

Introduction

Halal is the Arabic term for lawful or permissible – and within the food context, halal refers to the Islamic dietary standard (~~HMC, 2016~~[Regenstein et al. 2003](#)). Halal food products are a growing demand among Muslims across the world. This demand is projected to ~~double in the next three decades~~[contribute up to 17.4% of the world food market in 2018 \(Lubis et al., 2016; Thomson Reuters, 2015\)](#). The key drivers for this growth are understood to be population growth, an increase in halal consciousness and disposable income ([Thomson Reuters, 2015](#)).

The term halal is popularly associated with meat and food products, but it should be noted that halal is a way of life and driven by values based on the Qurʾān and Ḥadīth as well as post-Qurʾānic literature. The more elaborative expressions of this way of life can be located in the tommes of *fiqh* (Islamic legal thought). Therefore, halal encompasses a variety of sectors including pharmaceuticals, cosmetics, clothing, financial services, logistics, hospitality (Muhammad, 2015) and tourism (Henderson, 2015). The production trends of the halal food industry suggest that developed nations with minority Muslim populations are the biggest producers of meat aimed for the halal markets; for example: Australia (a beef producer), New Zealand (a lamb producer) and Brazil (a chicken producer) (Norāzmi and Lim, 2015). [The Halal food market was born in industrial countries to supply halal food to Muslim majority countries. In fact, the halal food trade was made possible by technological progress and access to free trade. \(Bergeaud-Blackler, 2010\). The provision of products by industrial countries for this market has now extended beyond halal food. \(Bergeaud-Blackler, 2010\).](#)

[Nevertheless, w](#)hilst these countries provide for the halal market, the halal nature of the meat provided by them is not void of scholarly contestations (Muftī ‘Uthmānī, 1997; Muftī ‘Uthmānī, 2006) ~~whilst meat products are strictly regulated in the halal food sector~~. The Islamic method of slaughter is known as *al-Dhabh* (Shragge and Price, 2014), and carrions, blood, porcine and meat of dead animals or those slaughtered without following the Islamic law are prohibited for consumption (Qurʾān: 2:168, 2:172, 5:3, 5:90, 23:51). Policy makers, scientists and food industries would benefit to understand, [in order to avoid such contestations](#), that the halal slaughtering process is rooted in the primary scriptures of Islam and is extensively discussed within classical Islamic legal texts (Al-Murghinānī, 1894) and modern day *fiqh* formulations (Al-Raḥmānī, 2006). Any compromise on these requirements renders the animal unconsumable.

The basic principles of Islamic law on the issue are quite definitive: that the animal is not one that is a prohibited animal to consume (e.g. lion, pig, shark, etc.) and the following rules are fulfilled during the slaughter process: i.e. the requisite invocation is recited upon the animal about to be slaughtered, the slaughterer is a Muslim [or a person of the Book \(as long as the latter believes in God, His Prophet](#)

– Moses or Jesus – and their scriptures) and the requirements of the process are fully met (Muftī Shaf‘ī, 1968). This is in accordance with the interdictions contained in the Qur’ān and related sciences. This pronouncement is highly important in order to obtain permission from the Creator before taking the life of another creature (Al-Qaradāwī, 1994). The slaughterer understands that the act is not an act of aggression rather a need necessitates it, and that, it must be carried out, in the name of the Creator (Allāh) (Farouk *et al.*, 2015). Further, the act must be carried out in a merciful manner as per Islamic *fiqh* stipulations (Al-Qaradāwī, 1994).

The focus of the above discussion is all the more important in the 21st century due to the volume and commercial value of the halal market and the halal process. In order to meet the market growth and sustain productivity, the halal supply chain may need to increase productivity further whilst of course maintaining the requirements of halal. In addition to this, there are also competing understandings between legal and Islamic stipulations regarding animal welfare (e.g. -slaughter without stunning) and concerns about animals being killed whilst receiving an overdose of stunning (e.g. electrical stunning of poultry). Hence, the emerging questions are: Can science and technology be balanced with religious jurisprudence? How can halal integrity (i.e. -animals being slaughtered according to the halal method) be ensured and how can the global demand for halal meat be served? In summary, how can the ‘middle way’ be maintained?

In this context at the heart of this paper are the following three themes:

1. To what extent does stunning impact impact ~~What constitutes~~ halal slaughter?
2. Who determines ~~what is halal slaughter~~ ~~this concept~~?
3. What are the ~~variations in dynamics of~~ religious and legal understandings of halal slaughter?

The paper undertakes a ~~literature a~~ review of ~~commercial poultry processing, followed by~~ -halal slaughtering ~~and stunning~~ of poultry. ~~The three themes are explored including both non-stunned and pre-slaughter stunned practices~~ with a view to recommend halal slaughter based on the different schools of legal thought. Likewise, this review will attempt to ensure integrity of religious slaughter whilst addressing religious regulations and promoting halal business performance in the food supply chain. This review does not intend to argue against any different school of legal thought or religious belief, but the aim is to evaluate objectively the various positions that may enable or even determine slaughter and consider the role of economics and market trends within this debate. The paper argues that halal slaughter even in the current age should be non-exploitative, fulfil Islamic stipulations, and be beneficial for both buyer and seller, irrespective of the growth in the halal food market. ~~In order to achieve this, there is a need for constructive dialogue between proponents and supporters of non-stunning methods. Farouk et al. (2014) summed up some key factors for consideration to understand the ‘scientific methods that have proven to harmonize the religious and spiritual requirements must be adopted to improve animal welfare and to produce meat of both high spiritual and conventional~~

qualities'. It is anticipated that this review is expected will to contribute to a better understanding of the above themes and to recommend further areas of study.

Poultry processing

This understanding is commenced by a study of poultry processing. Food scientists argue that large-scale poultry processing plants are designed to process between 4,000 to 12,000 birds per hour on a single line in order to meet consumer demand for non-religious poultry products (Raj, 2014; Schilling *et al.*, 2014). The practice of stunning before slaughter is a statutory requirement in Europe for non-religious products and applied to render animals unconscious. This, it is argued, is to ensure that the animal experiences no anxiety, pain, suffering or distress prior to the slaughtering process (Velarde *et al.*, 2014). The most common stunning method is electrical stunning (ES). It is relatively inexpensive and undemanding to apply. This involves a large fibreglass bath with brine/water with an overhead shackle line where birds are hung upside down and passed through the electrified water bath, whilst, a current flows through the whole body towards the shackle that serves as the earth (Raj, 2014; Schilling *et al.*, 2014). The birds then pass through the stunner in a continuous line and it can operate up to 220 birds per minute in a high throughput production site (Raj, 2014). There is a difference between Europe and the United States (US) regarding the strength of the current. An irreversible stun (120-150 mA per bird; 50 – 400 Hz) is used in the EU and in this case the birds are stunned to death (irreversible stunning) (EC 1099/2009; EFSA 2005; Schilling *et al.* 2014)

In the US birds are immobilized at low voltage ES (10-25 V) and high frequency (500 Hz) systems. In low voltage ES, birds will regain consciousness if not bled within 2 minutes after stunning. Other types of stunning include controlled atmosphere stunning (CAS) and low atmospheric pressure stunning (LAPS). CAS involves changing the surrounding atmosphere by reducing oxygen, increasing carbon dioxide, or a combination of both methods, or combination of oxygen with inert gases (e.g. nitrogen or argon). The LAPS, reduces atmospheric pressure (e.g. 0.20-0.29 ATM) by evacuating air from an airtight decompression chamber; this results in subsequent unconsciousness (Schilling *et al.*, 2014). The above mode of immobilisation (electrical stunning) is intensely contested for its halal authenticity for the Muslim consumer market (EHDA, 2016; HAIP 2015; HMC, 2016; Mufti 'Uthmānī, 1997). Other reviews of opposing and supporting views and issues are highlighted by Fuseini *et al.* (2016b), Regenstein (2012) and Zoethout (2013).

Nevertheless, alongside the stunning issue there is also another concern. From an animal welfare point of view, commercial electrical water bath may cause unnecessary pain and suffering otherwise caused by un-crating, shackling and pre-stunning electric shocks, inadequate stunning and recovery of consciousness leading to live birds to be scalded. Hence killing of poultry using gases whilst birds are transported within crates will, it is argued, eliminate the handling and stressing of live birds prior to stunning. This method was originally proposed by the Farm Animal Welfare Council in

the UK in 1982 (cited in Raj, 2014). It may be well in intention but challenges halal slaughter fulfilment.

To What Extent Does Stunning Impact Constitutes Halal Slaughter?

The practice of stunning albeit underpinned by good intentions simultaneously raises concerns regarding the fulfilment of the requirements of halal slaughter (Nakyinsige et al., 2013). One such is that the animal is not alive at the time of slaughter and the flowing blood has not completely drained out due to stunning. When poultry is stunned – although voltage and size of birds have been standardised – it is argued that some birds arrive at the slaughter process dead due to the stunning process (and different thresholds) or due to a delay in the time of reaching the slaughter process so the blood cannot be drained (Abū Ibrāhīm, cited in HMC 2016; Lever and Miele, 2012 HMC, 2016). ~~This totally compromises the halal definition.~~

~~"Stunning the animal before slaughter leaves a huge doubt into the halalness of the animal as many could be killed by the stunning especially in the case of poultry. Furthermore, it prevents the drainage of [the] entire blood resulting in it being retained in the animal and retained blood causes germs and bacteria, it deprives animals from the benefits of tasmiah due to it being unconscious, it is inhumane to animals and causes unnecessary pain and suffering. It is in reality not done for animal rights purposes, but in order for the industry to kill more animals quicker, so as to increase profits. According to the majority of the 'Ulamā stunning is not accepted in Islam and stunning could render the meat haram in many cases" (Abū Ibrāhīm, cited in HMC 2016; Lever and Miele, 2012).~~

Likewise, the currents used in electric stunning will induce cardiac arrest. This is linked with higher incidence of red wing tips in poultry (Ali et al. 2007; McNeal et al., 2003). ~~This is caused by inadequate bleeding of the birds after cardiac arrest where the wings of killed instead of stunned birds hang low resulting in stagnation of blood in the wing veins.~~ In order to prevent killing of birds and reducing quality defects and ensuring all blood is drained out, an alternative to whole body ES, is head only stunning where the stunning current only passes through the head of birds. Broilers (i.e. chicken produced for their meat) however may become unconscious and insensible after head-only ES with pin electrodes using a current of 190 ± 30 mA for 0.5 second (Lambooi, 2014). Velarde et al. (2014) observed that 11% of poultry showed rhythmic breathing after stunning. ~~However~~ But, 15% of the electrically stunned poultry showed rhythmic breathing at the moment of neck cutting and 5% showed this reflex 30 seconds later. Anastasov and Wotton argue that it is unreliable to use an absence of rhythmic breathing movement as a method to identify a loss of consciousness in birds (Anastasov and Wotton, 2012). The high percentage of rhythmic breathing after electrical stunning indicates that the settings of the stunning system or the interval between the end of current flow and cut interval might have been sub-optimal. Hence, a set current of 250 mA is recommended for

practical implementation to overcome individual differences in resistance (Lambooi, 2014). ~~Lambooi (2014) has recommended the minimal current for electrical stunning of poultry (Table 1).~~ The Department of Islamic Development Malaysia (2011) has also provided specific guidelines for religious pre-slaughter stunning of broiler. For example, broilers weighing between 2.40-2.70 kg should be stunned using 2.50 – 10.50 voltage for 3.00-5.00 seconds.

~~Insert Table 1 here~~

The Department of Islamic Development Malaysia (2011) support and argue that electrical water bath stunning is the 'most common method used at a poultry processing plant'. It also provides a set of stipulations for its lawful application. This is deemed as lawful and reversible, in its submission, thereby not compromising halal slaughter requirements. ~~On the other hand, Pakistan does not favour stunning (Pakistan follows the Hanafī School of legal thought) whilst Malaysia adheres to the Shāfi'ī School of legal thought and allows stunning (Lever and Miele, 2012). Pakistan has a huge animal resource base (Qureshi et al., 2012) is also one of the top halal meat producers to produce and export halal meat to United Arab Emirates (Farouk, 2013; ITC, 2015). Pakistan's method of slaughter also requires that the animals are laid on their left flank, preferably facing the Qibla (orientation towards Makkah, in modern day Saudi Arabia). This position (lying on the left flank) may also increase the likelihood of maximum draining of blood due to body pressure on the heart (Awan and Sohaib, 2016). The distinction between contemporary law regarding animal welfare and Islamic law does not apply to Islamic countries and Muslim majority countries. There is a conscious effort to ensure local halal standards are adhered to in such places. However, the interpretations may slightly vary on some issues albeit there is universal agreement on a set of benchmarks (see, Introduction).~~

However, irrespective of the variance in the interpretations regarding the use of stunning there is an assumption in this generic approach to the use of a predetermined electric current. This entails that whilst the weight parameter of every chicken may be set, will every chicken necessarily be able to bear the same current and remain alive after the set voltage has been applied. Poultry are of different strength even at a particular weight parameter and the capacity of each to bear the voltage current varies irrespective of weight (HMC, 2016). – This is why those who do not accept electric current stunning object. ~~(HMC, 2016).~~ The underlying question at the heart of the stunning debate is to assess whether the conditions stipulated by Islamic law are being met or not by the intervention of machinery. If so, then the animal would be halal otherwise not (Muftī Shaf'ī, 1968). Similarly, legislative requirements for stunning before slaughtering vary from country to country. The regulations of the United Kingdom are presented below as well as a generic overview of the European Union.

The Practice of Stunning in the United Kingdom

The Welfare of Animals' (Slaughter or Killing) Regulations 1995 (Statutory Instrument [SI]) No. 1995/731 as amended by SI No.1999/400, permits slaughter of animals (cattle, sheep, goats, turkeys, chickens, hens, guinea fowl, ducks, geese and quail). Schedule 5 Part II (which relates to stunning and killing of animals) does not apply to any animal which is slaughtered in accordance to Schedule 12 Part III (relates to slaughter by a religious method). It explains that slaughtering an animal without stunning it, is allowed to meet Jewish and Muslim religious requirements using Jewish and Islamic methods, respectively. In the case (the former is not the subject of this paper) of the latter:

- By a licensed Muslim slaughterman;
- In a licensed abattoir or licensed poultry slaughterhouse which is under the official veterinary supervision or other officially regulated poultry slaughterhouse (DEFRA, 2009)

Whilst legislation does allow religious slaughter without stunning, some academics raise potential welfare concerns regarding animal pain sensations during neck-slit slaughter (Gibson *et al.*, 2009), whilst others discuss fear and distress during new situations such as pre-slaughter handling (Duncan, 2004). There are equally concerns regarding the time taken to lose consciousness as a prolonged period of time suggests an animal experiences longer pain following the cut (Gregory *et al.*, 2010) and whether the animal experiences distress while bleeding out (Gregory, 2005). Likewise, concerns regarding suffering have also been raised regarding aspiration or inhalation of blood in the respiratory tract (Gregory *et al.*, 2009). Interestingly, the practice of stunning in the UK was first authorised in 1928 by an Islamic scholar from the Woking mosque (Slaughter of Animals Bill 1968). As the Muslim community grew in numbers post world war two, consequently the claims for public recognition of its needs had a similar trajectory and the discussions around Halal food for example intensified. Legal dispensations have allowed religious slaughtering as discussed above and that has been the preferred option.

In essence, in the U.K. the law determines what form of slaughter can take place. It is only legal dispensations that give license to religious communities the freedom to apply religious understandings to slaughtering animals. Equally, religious communities are required to remain within legal boundaries. Whilst U.K. legislation allows minority religious communities special dispensations, this has equally attracted contestations ~~from among~~ animal welfare practitioners. Conversely, minority communities uphold their own concepts of animal welfare and contest some secular understandings of the same. Some scholars argue that modern animal welfare requirements are in harmony with Islamic requirements (Farouk et al., 2016). -These indifferent understandings, at times, gives rise to tensions and misunderstandings. It further₇ highlights the challenges of maintaining a balance between the secular and the religious within societies. This is, all the₇ more challenging for religious communities in the European Union (E.U.).

The Practice of Stunning in the European Union

The Council Directive 93/119/EC of 22nd December 1993 relates to the protection of animals at the time of slaughter or killing. It applies to the movement, lairing, restraint, stunning, killing, and slaughtering of animals kept and bred for the production of meat, skin, fur or other products. It advocates that animals shall be spared any avoidable excitement, pain or suffering during those times. A competent authority is the central authority of a Member State [that is](#) competent to ensure compliance with the requirements of this Regulation or any other authority to which that central authority has delegated that competence. The religious authority in EU Member states where religious slaughtering is practised should be competent in the application and monitoring of the special provisions that apply to slaughter according to religious requirements. There should be an official veterinarian and the slaughter must take place in a slaughterhouse. As regards the said provisions, the authority shall operate under the official veterinarian designated by the central authority of the EU Member States as defined in Article 2 of Directive 64/433/EEC (Directive 64/443/EEC; EC Directive 93/119; EC Directive 1099/2009). The directive further explains that stunning shall not apply to animals subjected to particular methods of slaughter prescribed by religious rites, providing the slaughter take place in a slaughterhouse ([EC Directive 93/119](#); EC No. 1099/2009). [There are additional requirements under the Welfare of Animals at the Time of Killing \(England\) Regulation. For example, bBirds must be killed in a rapid, uninterrupted movement using undamaged knives of sufficient size and sharpness \(WATOK 2015a\).](#)

Nevertheless, slaughter without stunning is illegal in countries such as Iceland, Sweden, Denmark, Norway and Switzerland, and outside of the EU, for example, in New Zealand (Anil and Gregory, 2014; Kern, 2011).

In essence, whilst E.U. legislation allows minority religious communities special dispensations to avoid pre-slaughter stunning, some European countries deem it illegal. Consequently, there is inconsistency in slaughter practice across the E.U. and this has given rise to discussions around deconstructing the term halal in its dietary context where Muslims are living as a minority community, and giving rise to different interpretations.

Who Determines This Concept [of 'What is Halal' Slaughtering?](#)

The concerns around how best to take the life of an animal for human consumption in a manner that by law is seen as legal and humane, and as such constitutes animal welfare during slaughtering under secular law, has challenged not only what constitutes halal but also who determines that. This legal understanding is very much driven by the practice of stunning. The legal introduction of stunning and other practices has attracted different interpretations for what constitutes halal and how best the halal stipulations can be met even among Muslims. The diversity of the Muslim population has attempted to address such concerns in different ways. [In the West, both day to day slaughter](#)

[and industrial slaughter need to take place at a licensed abattoir. This is not necessarily the case in the Muslim world, where day-to-day slaughtering of a very small number of poultry may well happen at a market place rather than an industrial abattoir. Nevertheless, industrial practices are scrutinised Muftī Uthmānī, \(1418/\[1997\]\).](#)

The Muslim population is divided into two main groups, Sunnī and Shī'ite. The Sunni make up approximately 85-90% and the Shī'a 10-15% of the global Muslim population (Lapidus, 2014; CIA, 2016). Within the Sunnī population, there are four major schools of legal thought or jurisprudence (i.e. Ḥanafī, Shāf'ī, Mālikī and Ḥanbalī). Each of these legal schools of thought has varying degrees of regional influence (Lever and Miele, 2012). According to Codex Alimentarius Commission (CAC/GL 24 – 1997), the halal term is subject to different interpretations by these different schools of thought. They do not differ about what is haram and are united on the fundamentals of Islam.

It is important for those of the food industry interested in a share of the halal market and for food policy makers to understand that ultimately Islam is a religion of unity and that halal and haram originate from the Qur'ān and Ḥadīth. The differences between the four major schools of thought revolve around technicalities but there is room for diversity and reasoned discussion. In essence the Sunnī legal Schools agree on the aim of the slaughtering process, the place of slaughter (upper chest and throat), and the minimum required standards but hold minor differences in opinion regarding the complete fulfilment of the process of slaughtering. There are differences though in opinion between the legal schools of thought. These are tantamount to different interpretations regarding what constitutes halal practice and what compromises it (Wan-Hassan, 2007).

The Shī'a group is represented by three main branches (i.e. Ithnā 'Atharī, Ismā'īlī, and Zaidī) (CIA, 2016; van der Spiegel *et al.*, 2012). The Shī'ite law largely revolves around Ja'far al-Sādiq, the 6th Imam of Shī'ism. Shī'ite legal understanding differs regarding the sources of law to Sunnī law (Turner, 2011; Lapidus, 2014). Although there exists disagreement regarding some significant theological matters there are also overlapping areas of understandings on a range of issues. Shī'ism advocates a similar process to Sunnī Islam. It agrees on the place of slaughter and the technicalities (Al-Sistani, n.d.).

Stunning is widely used in the meat and poultry industry but is an ongoing source of controversy and there are differing opinions throughout the Muslim world, whilst there are strong objections to non-stunned slaughter in parts of the western world. For example, in the Western world, Denmark bans slaughter without stunning affecting both kosher and halal meat production (ITC, 2015). It is crucial for scientists to understand the difference in opinion in order to appreciate the legal impact of state policies on faith communities, e.g. as in Denmark for Jews and Muslims. In the Muslim world there is acceptance of pre-slaughter stunning practices in certain countries such as Malaysia where stunning

of bovine animals is allowed (Shāf'ī school of thought) but unacceptable in Pakistan (Ḥanafī, school of thought), and in areas of Europe, e.g. Russia or Poland (Lever and Miele, 2012).

The use of mechanical slaughter in halal abattoirs is also controversial and does not adhere to Islamic requirements (Muftī Shaf'ī, 1388/1968; Nakyinsige *et al.*, 2013). The DIALREL project (2010) evaluated the halal slaughter practices of poultry and visited abattoirs across Europe (Velarde *et al.*, 2014). It found similar differences in practice to the extent that some may be in conflict with halal slaughtering per se. It also found that mechanical slaughtering is permitted in certain abattoirs in EU (Velarde *et al.*, 2014). Velarde *et al.* (2014) reported that three out of the five poultry abattoirs that practiced halal slaughter with stunning performed the neck cutting procedure with an automatic horizontal rotary knife. This contradicts with halal requirements, where hand slaughter needs to should be conducted by a Muslim slaughterman and accompanied with the invocation of blessing prior to incision. Such practices raise concern regarding halal integrity, especially if such meat is to be exported to the Muslim world or to other parts of the EU where Muslim communities are domiciled. An absence of harmonised standards even across the Muslim world leaves ambiguity around 'Who determines what is halal?'

Similar cases of difference in practice and standards as well as Islamic legal interpretation can be seen in the UK where the Halal Food Authority (HFA) (Halal Food Authority, 2016a) certifies stunned halal meat (HFA also certifies traditional ḥalāl slaughtering (slaughter without stunning) and has a separate certification scheme and logo launched in October 2016 (HFA 2016b)) while the halal Monitoring Committee (HMC) (Halal Monitoring Committee, 2016) prohibits all methods of stunning, and has maintained this position since its inception.

The variance in practice and understanding within the UK ensures that the ~~was-selected~~UK becomes as-a focal point of discussion, as it represents an example of a Muslim minority country and provides an essential platform to analyse the challenges faced by both pre-stun and non-stun positions. Muslim consumers in a Muslim minority country faces more challenges in meeting their halal diet due to stricter regulations in terms of slaughter and potential risk of cross contact with non-halal or haram (non-permissible) food (Masri, 2007 cited in Fuseini et al., 2016b; Thomas et al. 2017). On the other hand, in most Muslim majority countries, abattoirs or meat processors do not have halal certification, as all the food are assumed to be halal (Fuseini et al., 2016b). Halal food were unknown to Muslim minority ~~majority~~ countries prior to globalization of the ~~the~~ food trade (Bergeaud-Blackler 2010). This creates better appreciation of the challenges faced by Muslim scholars, halal certification bodies and consumers in the UK.

HFA has been in the UK since 1994 and was one of the first few halal certification bodies (HFA 2017; Fuseini et al., 2017) and certified 75% of the UK's halal meat (Lever and Miele 2012), in particular

poultry in which the meats are slaughtered and electrically stunned in water baths (Higgin et al., 2011). HMC, which only certifies non-stunned halal meat, had criticised HFA's method of halal slaughter and stunning. ~~The Although~~ HFA continued to justify its method by arguing that ~~stating due to~~ due to the increasing demand for halal meat, there is a need for the use of mechanisation and stunning to render the animal immobilised. On the other hand, HMC believes that the demand for non-stunned halal meat can be met with the aid of ~~from~~ Muslim scholars or trained volunteers via a monitoring and assessment scheme (Lever and Miele 2012). 76% of Muslim consumers (n=1000) responded in EBLEX (2010) survey that they would reject stunning before slaughter and are more inclined to purchase meat from suppliers who sell only non-stunned meat or from shops selling both stunned and non-stunned meat. Although the study represents a snapshot of consumer purchasing and consumption of red meat profiles in England, it also demonstrates the demand for non-stunned halal meat. The data strongly suggests the awareness for halal food among the Muslim consumer and also alludes to lesser awareness among a small group. This is evident when HFA recently launched a separate certification for the traditional halal (stun free) sector of the meat industry (HFA 2016b) due to industry, current and potential consumers' interest. Consequently, this will impact upon whether food integrity is held to be compromised or not. Food integrity here refers to ensuring food products are halal. Both HFA and HMC are non-profit charity organisations (HFA 2017; HMC 2017) who are carrying out certifications to ensure the production and compliance of halal food products that fulfil requirements from different groups of consumers.

It is not the aim of this paper, as stated in the introduction, to discuss religious rules, rather it is to form an understanding of Islamic dietary practices and to conceptualise the ~~dynamics-variations~~ of legal and religious understandings of halal slaughter. The conventional cliché of supply and demand and its dictates can broadly capture the productivity scenario but the preferred consumer criteria of 'halal' (possibly captured as consumer ethics) and its demand may well govern the market as consumer awareness of market practices increases. The degree of acceptance of stunning, hand slaughtering or mechanical slaughtering and recommendations for balance between valuing ethical factors and fulfilling commercial interest is of particular significance for both buyer and seller of poultry and meat. Such factors will also bear on the rate of productivity. Different groups of Muslims champion a different halal criterion ~~for on~~ some ingredients as well as the slaughter method (van der Spiegel *et al.*, 2012). The process of stunning is very much a grey area in both the legal secular and Shar'iah law and its use is still widely controversial (ITC, 2015) and attracts strong debate on halal integrity as well as animal welfare.

Dynamics-Variations in Religious and Legal Understandings on Halal Slaughter

The religious slaughter of animals is not a form of sacrificial practice. Rather it is concerned with humane slaughter of God's creature (Shragge and Price, 2014). ~~Table 2~~Figure 1 provides pointers on how halal integrity is maintained without stunning.

Insert [Table 2-Figure 1](#) here

Animal Welfare and Pre-slaughter Stunning

According to the Universal Declaration of Animal Rights (UDAW), all animal life has the right to be respected, and if it is necessary an animal can be slaughtered. This should be carried out instantaneously, painlessly and in a way that results in no apprehension (Chapouthier and Nouët, 1998). In the current scenario of high demands for meat, religious slaughter at times finds itself in conflict with the standard operating procedures (SOPs) of high-speed, high-throughput abattoirs. There are also welfare concerns about religious slaughter without stunning – particularly regarding pre-slaughter stress, pain of the incision and the duration of time between incision and unconsciousness (Anil and Gregory, 2014) ~~to address these concerns stunning is used~~. The purpose of stunning is to induce lack of consciousness and sensibility so the animal can be slaughtered and bled without causing pain and distress (EC Directive 1099/2009; WATOK 2015b; EC Directive 93/119 1993; Gregory 1998).

~~to render the animal unconscious so they can be slaughtered and bled without causing pain and distress (EC Directive 93/119 1993; Gregory, 1998). Despite the derogation from stunning, a number of Muslim authorities have accepted stunning as part of their halal slaughter procedure (MS 1500, 2009; Indonesian Standard MUI HAS 23103, 2012; OIC 2009). In the UK, up to 84% poultry were stunned at 27 establishments in 2013 (FSA 2015; Fuseini et al., 2016a).~~ Advocates of pre-slaughter stunning maintain that stunning prior to slaughter is more humane than not stunning at all. Advocates of religious slaughter methods that do not practice pre-slaughter stunning equally believe that their method is humane (Anil and Gregory, 2014). In fact, the unanimous view in Islam is that slaughter without stunning is valid and achieves the requirements. However, there are equally other views within Islamic *fiqh* that stunning subject to certain conditions is acceptable.

The discussions regarding the validity of stunning can be summarised as follows. There are a number of views whether stunning before slaughter is acceptable or not in Islam:

- i. Acceptance with certain conditions (i.e. reversible stunning);
- ii. Rejection on grounds that it is against religious rules, painful induction and causes insufficient blood loss (as blood is considered *ḥarām*);
- iii. Unsure or require assurances (Anil and Gregory, 2014).

The first view provides a level of acceptance in pre-slaughter stunning based on the interpretation and application of sources of jurisprudence, namely ~~the~~ *Ijmā* (consensus of legal opinion) and *Qiyās* (reasoning by analogy) to suit time, place and circumstances (Regenstein *et al.*, 2003). Hence, some

Muslim scholars have accepted non-lethal methods of stunning to meet legal requirements. Fuseini *et al.* (2017) reported the majority of Islamic scholars and consumers from a survey in the UK said that reversible stunning is halal compliant. The adoption of stunning prior to slaughter must nevertheless fulfil three pre-requisites:

- i) The stunning equipment must only be handled by a trained Muslim slaughter man or supervisor and is regularly monitored by a competent Islamic authority or halal certification body (Department of Islamic Development Malaysia, 2011; MS1500: 2009).
- ii) The stunning must not kill the animal nor cause permanent injury and is reversible.
- iii) The stunning equipment used to stun pigs must never be used to stun animals for halal slaughter (MS1500: 2004)

Figure 1-2 below summarises the above and represents the current transcending halal slaughter practices that attempt to balance the variations dynamics of secular and religious needs for halal meat.

Insert Figure 1-2 here

In summation, there are three positions on pre-slaughter stunning: non-religious slaughter, stunned halal slaughter subject to conditions and non-stunned halal slaughter. It may be a difficult task to address the concerns of all parties concerned. Whilst all parties agree that animal welfare is of paramount importance there is a degree of difference on how best to achieve this in practice. Interestingly, each view would label its position as the ethical position. The situation across different countries is very different regarding whether non-stunned religious slaughter is lawful or not. Some countries have accommodated freedom of religious choice whilst others have only allowed secular legal choice for both religious and non-religious communities.

Conclusion

This paper has considered different perspectives on ~~the~~ religious slaughter and provided an overview of competing understandings regarding the concept of 'What constitutes halal slaughter?', 'Who determines this concept?' and 'What are the dynamics and tensions between legal and religious understandings of halal slaughter?' In practice, this equates to evaluating the application of no stunning at all upon an animal (unanimous acceptance) versus the application of reversible stunning upon an animal (contested). There are numerous studies that have focused on pre-slaughter stunning, slaughter without stunning and measurement of pain stimuli and nociception. These studies contribute to the understanding of different slaughter requirements in religious slaughter and the meat industry. Stunning, however, remains a controversial and grey area in religious slaughter. Malaysia as a leading and global halal research hub has further categorised stunning according to

weight categories to deliver appropriate stunning whilst ensuring the animal remains alive but unconscious prior to slaughter. [This represents an attempt by Malaysia to close the gap between religious and secular legal frameworks and stipulations.](#) There are equally other issues to contend with: the consumers' increasing demand for halal meat, different requirements from different schools of thought and fulfilling halal integrity principles; it is indeed a challenging task but not unachievable. [It is acknowledged that religious slaughter is slower, requires more skill and attention to animal handling and the extra requirements of halal preparation place additional burdens on food processors especially small and medium producers \(Regenstein, 2012; 2017; Thomas et al. 2017\). Works by Grandin \(<http://www.grandin.com/>\) and the collaboration between religious groups and the World Health Organization for Animals \(OIE\) and DIALREL in Europe can help to address the challenges \(Grandin, n.d.; Regenstein, 2017\).](#) In a practical sense, consumers who demand non-stunned halal meat or prefer stunned halal meat could have freedom of religious choice to meet their dietary requirements [notwithstanding the cost implicaitons](#). No doubt, there are differences in opinion regarding the use of stunning but a key question for future research is 'How did we get to where we are now?' ~~Given that, in essence Islam emphasises non-stunning h~~How did the stunning debate originate and even impact market practices? ~~-Stunning is not mentioned in the Qur'an nor in the body of Hadith literature. as-~~[It is a relatively new method. But the requirements and principles of halal slaughtering are provided in the primary sources of Islam. -This h](#)~~Has this-~~[led to the issue of stunning being discussed in ølegal formulations -or edicts or Fatwas \(Islamic rulings\) regarding ø](#)~~whether the technology is acceptable as halal or not? (Fuseini et al., 2016). The underlying question at the heart of the stunning debate is to assess whether the conditions and broad aims stipulated by Islamic law are being met or not by the intervention of machinery (Mufti Shaf'i, 1968). This suggests that Muslims scholars have been engaging with the outcomes of scientific research and its methodologies. At times the outcomes have been embraced and at other times not at that point of development. -The current researchers also propose that the history of stunning to be further evaluated.~~

Obviously, the increase in demand for halal meat (whether stunned or non-stunned) will [require spurincreased](#) -production and supply. But will religious slaughter (i.e. without stunning and hand slaughter) practices be able to cope with the increase in demand? This raises another key research question, 'Will consumers be willing to pay the premium for non-stunned halal meat?' There are other interesting research questions that stem from this paper e.g. 'What constitutes animal welfare in conventional and religious slaughter and who determines this concept?' Nevertheless, there remains more unanswered questions than solutions but ultimately, it is important to understand that halal is a way of life and embraces good conduct and integrity or ethics in Islamic dietary practices [too](#). So, with the ever-changing world of science and technology versus consumerism and population increases as well as migration cycles that bring different communities with ethical dietary demands together, the intriguing question remains how will the relationship between technology and religious

ethics take shape? Further, how will migration cycles impact upon religious interpretation?

Transnational migration and globalisation are important processes in the diffusion of dietary and cultural patterns. Since the 1970s, the migration of large Muslim communities into the EU had led to some EU countries to take their dietary needs and religious slaughter into account within their national laws (Adams, 2011; Adamson, 2006). Finally, how will the existence of a growing halal market with huge commercial value ~~to~~ be negotiated and impact upon the practices of supplier chains? Ultimately, the absorption of migrant religious communities and how their growth and needs are addressed by host communities through the vehicle of state policies as part of a liberal democracy, may well determine the outcome. Likewise how entrepreneurs seize huge commercial opportunities and provide bespoke products may also determine the outcome. The future may not simply be captured by the cliché 'supply and demand' rather it may well be 'supply tailored for ~~the~~ demand'!

References

- Adams, I. A. (2011), "Globalization: Explaining the dynamics and challenges of the halal food surge", Intellectual Discourse, Vol. 19, pp. 123-145.
- Adamson, F. B. (2006), "Crossing borders: International migration and national security", International Security, Vol. 31, pp. 1-21.
- Algers, B. and Atkinson, S. (2014). Stunning: Mechanical stunning. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 413-417.
- Ali, A., Lawson, M. A., Tauson, A.-H., Jensen, J. F. and Chwalibog, A. (2007), "Influence of electrical stunning voltages on bleed out and carcass quality in slaughtered broiler chickens", Archiv fur Geflugelkunde, Vol. 71, No. 1, pp. 35-40.
- Al-Bukhārī, M. (trans. Muḥammad Muḥsin Khān) (n.d.), *The Translation of Meanings of Al-Saḥīḥ al-Bukhārī*, (vol. 1-9), Dār al-Fikr, Beirut, Lebanon.
- Al-Murghinānī, B. (1311A.H./[1894]). *Al-Hidāya*. Islamic Books: Karachi: pp.432-441, vol. 4
- Al-Qaradāwī, Y. (1994). The lawful and the prohibited in Islam. Trans: Ahmad Zaki Hammad. Indianapolis: American Trust Publications.
- Al-Raḥmānī, M.K.S. (2006). *Qāmus al-Fiqh*, Haydarabad, India: Al-Ma 'had al- 'Ālī al-Islāmī pp. 451-459, vol. 3
- Al-Sistānī, A.-S. A. A.-H. (n.d.). Slaughtering and hunting of animals. <http://www.sistani.org/english/book/48/2367/>. Accessed 27 November 2016.
- Al-Zuhaylī, W. (2002) (vol. 4) *Al-Fiqh al-Islām wa Adilatuhu*, Syria: Damascus: Dār al-Fikr, pp. 2756-2801
- Anastasov, M. I. and Wotton, S. B. (2012), "Survey of the incidence of post stun behavioural reflexes in electrically stunned broilers in commercial conditions and the relationship of their incidence with the applied water bath electrical parameters", *Animal Welfare*, Vol. 22, No. 2, pp. 247-256.
- Anil, M. H. and Gregory, N. G. (2014). Slaughter, ethics and the law. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 280-283.

- Appelt, M., Allen, A. and Will, D. (2014). Slaughter: Immobilization. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 418-420.
- Awan, J. A. and Sohaib, M. (2016), "Halal and humane slaughter: Comparison between Islamic teachings and modern methods", *Pakistan Journal of Food Science*, Vol. 26, No. 4, pp. 234-240.
- Bergeaud-Blackler, F. (2010). Chapter 6. Islamizing food: the encounter of market and diasporic dynamics. In, *Halal Matters: Islam, politics and markets in global perspective*. Bergeaud-Blackler, F., Fischer, J. and Lever, J. (Eds). London: Routledge, pp. 91-104
- BVA, British Veterinary Association (2014), "All-party group supports BVA call for clearer meat labelling", available at <http://www.bva.co.uk/News-campaigns-and-policy/Newsroom/News-releases/All-party-group-supports-BVA-call-for-clearer-meat-labelling/> (accessed 19 December 2015).
- CAC (Codex Alimentarius Commission) (1997). *CAC/GL 24-1997 General Guidelines for use of the term "halal"*, s.l.: Codex Alimentarius Commission.
- Cervero, F. and Merskey, H. (1996), "What is a noxious stimuli?" *Pain Forum*, Vol. 5 No. 3, pp. 157-161.
- Chandia M. (2015). *Translation of the Holy Qur'ān*. London: Azhar Academy.
- Chapouthier, G. and Nouët, J.-C. (1998), "The Universal Declaration of Animal Rights: Comments and intentions", *Ligue Francaise des Droits de l'Animal*, pp. 1-93.
- CIA, Central Intelligence Agency (2016), "Religions: The world factbook", available at <https://www.cia.gov/library/publications/the-world-factbook/fields/2122.html> (accessed 5 December 2016).
- City Press (2015), "Muslims expect to celebrate Eid this Sunday", available at <http://www.news24.com/Archives/City-Press/Muslims-expect-to-celebrate-Eid-this-Sunday-20150429> (accessed 25 November 2015).
- DEFRA Department for Environment, Food and Rural Affairs (2009), "Animal welfare: Qurbani/Udhia", available at <http://webarchive.nationalarchives.gov.uk/20130402151656/http://archive.defra.gov.uk/foodfarm/farmanimal/welfare/slaughter/qurbani-udhia.htm> (accessed 1 December 2015).
- Department of Islamic Development Malaysia (2011), "Malaysian protocol for the halal meat and poultry productions", available at <http://www.halal.gov.my/v2/cms/content/editor/files/File/MALAYSIAN%20PROTOCOL%20FOR%20HE%20halal%20MEAT%20&%20POULTRY%20PRODUCTIONS.pdf> (accessed 3 December 2015).
- Directive 64/433/EEC (1964), "Council directive of 26 June 1964 on health problems affecting intra-Community trade in fresh meat", *Official Journal of the European Communities* 2012/64, 185-197.
- Duncan, I. J. H. (2004), "Pain, fear and distress. Applying Science to Animal Welfare", *Proceedings on Global Conference on Animal Welfare: an OIE initiative*, pp. 160-169.
- EBLEX (2010), "The halal meat market: Specialist supply chain structures and consumer purchase and consumption profiles in England", Available at: http://beefandlamb.ahdb.org.uk/wp-content/uploads/2016/03/p_cp_EBLEX_Halal_Meat_FINAL_111110.pdf [Accessed 16 May 2017]

EC Directive 93/119 (1993), "Council Directive 93/119/EC of 22 December 1993 on the protection of animals at the time of slaughter or killing", *Official Journal of the European Communities* Vol. L340, pp. 21-34.

EC No. 1099/2009 (2009), "Council regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing", *Official Journal of the European Union*, Vol. L303/1, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:303:0001:0030:EN:PDF> (accessed 1 December 2015).

[EHDA \(2016\), "European Halal Development Agency", Available at: http://ehda.co.uk/faq-2/](http://ehda.co.uk/faq-2/)
[Accessed 17 May 2017]

EFSA (European Food Safety Authority) (2005), "Opinion of the Scientific Panel on Animal Health and Welfare (AHAW) on a request from the Commission related to welfare aspects of the main systems of stunning and killing the main commercial species of animals", *EFSA Journal*, Vol. 45, pp. 1-29.

[Farouk, M. M. \(2013\), "Advances in the industrial production of halal and kosher red meat", *Meat Science*, Vol. 95, No. 4, pp. 805-820.](#)

[Farouk, M. M., Al-Mazeedi, H. M., Sabow, A. B., Bekhit, A. E. D., Adeyemi, K. D., Sazili, A. Q. and Ghani, A. \(2014\), "Halal and kosher slaughter methods and meat quality: A review", *Meat Science*, Vol. 98, No. 3, pp. 505-519.](#)

Farouk, M. M., Regenstein, J. M., Pirie, M. R., Najm, R., Bekhit, A. E. D. and Knowles, S. O. (2015), "Spiritual aspects of meat and nutritional security: Perspectives and responsibilities of the Abrahamic faiths", *Food Research International*, Vol. 76 No. 4, pp. 882-895.

[FSA \(2015\), "Results of the 2013 animal welfare survey in Great Britain", Food Standards Agency. Available at: https://www.food.gov.uk/sites/default/files/2013-animal-welfare-survey.pdf](https://www.food.gov.uk/sites/default/files/2013-animal-welfare-survey.pdf) [Accessed 16 May 2017]

[Fuseini, A., Knowles, T. G., Hadley, P. J. Wotton, S. B. \(2016a\), "Halal stunning and slaughter: Criteria for the assessment of dead animals", *Meat Science*, Vol. 119, pp. 132-137.](#)

[Fuseini, A., Knowles, T. G., Lines, J. A., Hadley, P. J. Wotton, S. B. \(2016b\), "The stunning and slaughter of cattle within the EU: a review of the current situation with regard to the halal market", *Animal Welfare*, Vol. 25, pp. 365-376.](#)

Fuseini, A., Wotton, S. B., Hadley, P. J. and Knowles, T. G. (2017), "The perception and acceptability of pre-slaughter and post-slaughter stunning for halal production: The views of UK Islamic scholars and halal consumers", *Meat Science*, Vol. 123, pp. 143-150.

Gibson, T. J., Johnson, C. B., Murrell, J. C., Hulls, C. M., Mitchinson, S. L., Stafford, K. J., Johnstone, A. C., Mellor, D. J. (2009), "Electroencephalographic responses of halothane-anaesthetised calves to slaughter by ventral-neck incision without prior stunning", *New Zealand Veterinary Journal*, Vol. 57, No. 2, pp. 77-83.

[Grandin, T. \(n.d.\), "Livestock behaviour, design of facilities and humane slaughter", Available at: http://www.grandin.com/](http://www.grandin.com/) [Accessed 15 May 2017]

Gregory, N. G. (1998). *Animal welfare and meat science*. New York: CABI Publishing.

- Gregory, N. G. (2005), "Recent concerns about stunning and slaughter", *Meat Science* Vol. 70, pp. 481-491.
- Gregory, N. G., von Wenzlawowicz, M. and von Holleben, K. (2009), "Blood in the respiratory tract during slaughter with and without stunning in cattle", *Meat Science* Vol. 82, No. 1, pp. 13-16.
- Gregory, N. G., Fielding, H. R., von Wenzlawowicz, M. and von Holleben, K. (2010), "Time to collapse following slaughter without stunning in cattle", *Meat Science*, Vol. 85, No. 1, pp. 66-69.
- Halal Focus (2015), "Saudi Arabia: OIC forum on global unified halal food standards", available at <http://halalfocus.net/saudi-arabia-oic-forum-on-global-unified-halal-food-standards/> (accessed 27 November 2016).
- Henderson, J. C. (2016), "Halāl food, certification and halal tourism: Insights from Malaysia and Singapore", *Tourism Management Perspectives*, Vol. 19, No. Part B, pp. 160-164.
- HFA, Halal Food Authority (2016a), "Frequently asked questions", available at <http://halalfoodauthority.com/faqs> (accessed 27 November 2016).
- HFA, halal Food Authority (2016b), "HFA certification of traditional halal slaughter (without stunning)", available at <http://halalfoodauthority.com/faqs/traditional-halal> (accessed 27 November 2016).
- [HFA \(2017\), "Home/Our company", Available at: http://halalfoodauthority.com/about-us](http://halalfoodauthority.com/about-us) [Accessed 16 May 2017]
- [Higgin, M., Evans, A. and Miele, M. \(2003\), "A good kill: socio-technical organization of slaughter", In, N. Charles and B. Carter \(Eds\). Humans and Other Animals: Critical Perspectives. London: Palgrave MacMillan, pp. 173-185.](#)
- HMC, Halal Monitoring Committee (2016), "Issues of mechanical slaughter and stunning", available at <http://www.halalhmc.org/IssueOfFMSandStunning.htm> (accessed 27 November 2016).
- [HMC \(2017\). Halal monitoring committee. Available at: http://www.halalhmc.org/index.htm](http://www.halalhmc.org/index.htm) [Accessed 16 May 2017]
- Hoorfar, J., Jordan, K., Butler, F. and Prugger, R. (2011). *Food chain integrity: A holistic approach to food traceability, safety, quality and authenticity*. Cambridge: Woodhead Publishing, pp. 1-338.
- Ibn Al-Ḥajjāj, M. (1407A.H./1987), *Ṣaḥīḥ Muslim*, (1st ed.) Dār al-Rayyān, Cairo, Egypt.
- [Indonesian Standard MUI HAS \(2012\), "Guidelines of halal assurance system criteria on slaughterhouses", Majelis Ulama Indonesia.](#)
- [ITC \(2015\). Trade map – International trade statistics. Available at: http://www.trademap.org/tradestat/Country_SelProductCountry_TS.aspx](http://www.trademap.org/tradestat/Country_SelProductCountry_TS.aspx) [Accessed 15 May 2017]
- Kern, S. (2011), "Europe goes Halal. Gatestone Institute", available at <http://www.gatestoneinstitute.org/1799/europe-goes-halal> (accessed 19 December 2015).
- Kettlewell, P. J. and Hallworth, R. N. (1990), "Electrical stunning of chickens", *Journal of Agricultural Engineering Research*, Vol. 47, pp. 139-151.
- Lambooi, E. (2014). Electrical stunning. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 407-412.

- Lapidus, I. M. (2014). *A History of Islamic Societies*. Cambridge University Press, pp. 842-846.
- Lever, J. and Miele, M. (2012), "The growth of halal meat markets in Europe: An exploration of the supply side theory of religion", *Journal of Rural Studies*, Vol. 28, No. 4, pp. 528-537.
- Lubis, H. N., Mohd-Naim, N. F., Alizul, N. N. and Ahmed, M. U. (2016), "From market to food plate: Current trusted technology and innovations in halal food analysis", *Trends in Food Science & Technology*, Vol. 58, pp. 55-68.
- McNeal, W. D., Fletcher, D. L. and Buhr, R. J. (2003), "Effects of stunning and decapitation on broiler activity during bleeding, blood loss, carcass, and breast meat quality", *Poultry Science*, Vol. 82, No. 1, pp. 163-168.
- MS 1500: 2009 (Malaysian Standard) (2009), "Halal food – Production, preparation, handling and storage – General guidelines", (Second Revision). Department of Standards Malaysia, available at <https://law.resource.org/pub/my/ibr/ms.1500.2009.pdf> (accessed 3 December 2015).
- Muftī Shaf'ī (1968). *Jawāhir al-Fiqh*, India: Deoband, pp. 363-416.
- Muftī Uthmānī, T.M. (1418/[1997]). *Ahkām al-dhabā'ih*, Karachi, New Guzār Press.
- Muftī Uthmānī, T.M. (2006). *The Islamic Laws of Animal Slaughter*, trans. Toft, A., Santa Barbara, California, USA: White Thread Press.
- Muḥammad, R. (2015), "The global halal market: Stats and trends", <http://halalfocus.net/the-global-halal-market-stats-trends/> (accessed 19 December 2015).
- Nakyinsige, K., Che Man, Y.B., Aghwan, Z.A., Zulkifli, I., Goh, Y.M., Abu Bakar, F., Al-Kahtani, H.A. and Sazli, A.Q. (2013), "Stunning and animal welfare from Islamic and scientific perspectives", *Meat Science*, Vol. 95, pp. 352-361.
- Norazmi, M. N. and Lim, L. S. (2015), "Halāl pharmaceutical industry: opportunities and challenges", *Trends in Pharmacological Sciences*, Vol. 36, No. 8, pp. 496-497.
- OIC (2009), "General guidelines on halal food", The Organisation of the Islamic Conference (OIC). Available at: <http://halalworldinstitute.org/download/standard/filegallery/60/.pdf> [Accessed 16 May 2017]
- OIC, Organisation of Islamic Cooperation (2015), "Forum on global unified halal food standards to be held at OIC General Secretariat, Jeddah", available at http://www.oic-oci.org//topic/?t_id=10706&t_ref=4215&lan=en (accessed 13 December 2016).
- Qureshi, S. S., Jamal, M., Qureshi, M. S., Rauf, M., Syed, B. H., Zulfiqar, M. and Chand, N. (2012), "A review of halal food with special reference to meat and its trade potential", *Journal of Animal and Plant Sciences*, Vol. 22, No. Suppl. 2, PP. 79-83.
- Raj, A. B. M. (2014). Stunning. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 401-406.
- Regenstein, J. M., Chaudry, M. M. and Regenstein, C. E. (2003), "The Kosher and halal food laws", *Comprehensive Reviews in Food Science and Food Safety*, Vol. 2, pp. 111-127.
- Regenstein, J. M. (2012), "The politics of religious slaughter – how science can be misused", 65th Annual Reciprocal Meat Conference of the American Meat Science Association. Available at: http://www.meatscience.org/docs/default-source/publications-resources/rmc/2012/25_regenstein_r2.pdf?sfvrsn=0 [Accessed 17 May 2017]

Regenstein, J. M. (2017), "Religious slaughter of animals: International efforts to meet this need responsibly. *Global Food Security and Wellness*. New York: Springer, pp. 339-355.

RSPCA, (2015), "Slaughter without pre-stunning (for religious purposes)", RSPCA Farm Animals Department Information Sheet, available at <http://www.rspca.org.uk/adviceandwelfare/farm/slaughter/religiouslaughter> (accessed 19 December 2015).

Schilling, M. W., Vizzier-Thaxton, Y. and Alvarado, C. Z. (2014). Slaughter-line operation: Poultry. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 303-308.

Shragge, J. E. and Price, M. A. (2014). Religious slaughter. In *Encyclopedia of Meat Sciences*, eds. M. Dikeman and C. Devine, Vol. 3, 2nd Ed. San Diego: Academic Press, pp. 209-213.

Slaughter of Animals Bill (1962) 28. Dec 03 1962 Vol 245, cc27-64", Available at: <http://hansard.millbanksystems.com/lords/1962/dec/03/slaughter-of-animals-bill-hl-2> [Accessed 17 May 2017]

SMIIC [Standards and Metrology Institute for Islamic Countries] (2016), "SMIIC Committee on standards for conformity assessment (SMIIC/CCA)", available at <http://www.smiic.org/smiic-committee-on-standards-for-conformity-assessment-smiic-cca/560/smiic-cca> (accessed 27 November 2016).

Thomas, A. M., White, G. R. T., Plant, E. and Zhou, P. (2017), "Challenges and practices in halal meat preparation: a case study investigation of a UK slaughterhouse", *Total Quality Management & Business Excellence*, Vol. 28, No. 1- 2, pp. 12-31.

Thomson Reuters (2015), "State of the global Islamic economy", Available at: https://www.flandersinvestmentandtrade.com/export/sites/trade/files/news/342150121095027/342150121095027_1.pdf [Accessed 17 May 2017]

Turner, C. (2011) *Islam: The Basics*, London: Routledge, pp. 91-99.

van der Spiegel, M., van der Fels-Klerx, H. J., Sterrenburg, P., van Ruth, S. M., Scholtens-Toma, I. M. J. and Kok, E. J. (2012), "Halal assurance in food supply chains: Verification of halal certificates using audits and laboratory analysis", *Trends in Food Science & Technology*, Vol. 27, No. 2, pp. 109-119.

Velarde, A., Rodriguez, P., Dalmau, A., Fuentes, C., Llonch, P., von Holleben, K. V., Anil, M. H., Lambooi, J. B., Pleiter, H., Yesildere, T. and Cenci-Conga, B. T. (2014), "Religious slaughter: Evaluation of current practices in selected countries", *Meat Science*, Vol. 96, pp. 278-287.

Wabek, C. (1988), "How stunning affects product quality", *Poultry International*, Vol. Feb, pp. 48-52.

Wan-Hassan, W. M. (2007), "Globalising halal standards: Issues and challenges", *The Halal Journal*, Vol. July-August, pp. 38-40.

WATOK (2015a), "Schedule 3 Additional requirements for killing animals in accordance with religious rites", Available at: <http://www.legislation.gov.uk/ukxi/2015/1782/schedule/3/made> [Accessed 16 May 2017]

WATOK (2015b), "The Welfare of Animals at the Time of Killing (England) Regulations 2015. Schedule 1 Additional requirements for slaughterhouses", Available at: <http://www.legislation.gov.uk/ukxi/2015/1782/schedule/1/made> [Accessed 16 May 2017]

859
860 Welfare of Animals (Slaughter or Killing) Regulations (1995), "Statutory Instruments 1995 No. 731
861 Animals Prevention of Cruelty", available at
862 <http://www.legislation.gov.uk/ukxi/1995/731/introduction/made> (accessed 1 December 2015).
863
864 Woerner, D. R., Scanga, J. A. and Belk, K. E. (2014). Slaughter-line operation: cattle. In, M.
865 Dikeman and C. Devine (eds.). *Encyclopedia of Meat Sciences*, Vol. 3, 2nd Ed. San Diego: Academic
866 Press, pp. 284-289.
867
868 Zhang, Z., Cao, J., Wang, Z., Dong, Y. and Chen, Y. (2014), "Effect of a combination of green and
869 blue monochromatic light on broiler immune response", *Journal of Photochemistry and Photobiology*
870 *B: Biology*, Vol. 138, pp. 118-123.
871
872 Zoethout, C. M. (2013), "Ritual slaughter and the freedom of religion: Some reflection s on a
873 stunning matter", Human Rights Quarterly, Vol. 35, No. 3, pp. 651-672

