



## Halal Integrity in the Food Supply Chain

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## Halal Integrity in the Food Supply Chain

### Abstract

Purpose: This paper argues that there is an absence of halal integrity within the conventional stages of a food chain. This paper adapts the understanding of the different stages and argues the need to develop a critical consciousness for halal integrity within the food chain to address the needs of the ever-growing Muslim consumers' market. The aim of this paper is to propose a definition of halal integrity using farm to fork and global food supply chain models.

Design: The study includes a review of priori literature and media reports regarding cross contamination of food products with haram (forbidden) components. This background will be used to conceptualise halal integrity using farm to fork and a global supply chain models.

Findings: Different interpretations of halal – what is permitted and what is prohibited – exist for the different schools of Islamic legal thought and within the customs of different countries. In order to ensure that food production is embrasive of the religious needs of the global Muslim customer market, this paper utilises the farm to fork and global supply chain models to foster a critical awareness of halal needs. Halal integrity should be clearly presenting the details of the halal status of the product and assuring that the requirements for halal as stated are met. Halal integrity not only deals with permitted and prohibited foods, but that the halal status of the food products (i.e. from raw materials until it reaches the consumers) should not be breached (i.e. no cross contamination with haram products / methods and no ill intents). A formal definition of halal integrity has been proposed.

Research limitations: The SWOT analyses serve as a guideline as the analysis done may be outdated as the environments are constantly changing.

Originality/value – This research although academic is meant to have a real value in improving the integrity of the halal food supply chain, providing value to the food industry, to countries that are concerned about this supply chain and to Muslim consumers. Halal integrity is crucial to the success of the emerging halal market.

Keywords: food supply chain; halal; halal certification; haram; Islam; Muslims; traceability

### Introduction

Halal is an Arabic phrase for something that is permitted according to Islamic law (Riaz and Chaudry 2004). These principles extend beyond dietary requirements and underpin all types of human conduct for adherents of the Islamic faith, including beliefs, actions, diet, clothes, modes of earnings,

relationships, etc. The term 'halal' with reference to food covers all the aspects starting from the farm and ending at the table of a halal observant home. Halal food must be free of any components that Muslims are prohibited from consuming, which is known as haram. Based on Qur'anic guidance (Qur'an, 2:168, cited in Chandia, 2015), all foods are halal except those that are specifically mentioned as haram. Haram foods can be divided into several main categories, and include any products derived from or contaminated with these prohibited materials, ~~e.g. such as~~, carrion, blood, pig, permitted animals slaughtered incorrectly, and intoxicants. Recently, examples of haram contamination and dishonest behaviour with halal certified products highlight (Table 1) areas of concern to Muslim consumers as they are dependent on the food industry and policy makers to assure the integrity of the halal supply chain. Food processors may choose to use pork derivatives, other non-halal slaughtered meats and gelatine to substitute meat products because they are cheap and readily available (Aida *et al.*, 2005). This raises the question of what is halal integrity and what measures can be taken to assure that products are produced and handled with integrity? The paper aims to provide an eclectic appreciation of relevant sources, critically understand their nuances and implications to bridge the needs of halal integrity within the food chain. This is supported by providing a critical independent analysis which presents an ethical framework that is more embracive of the religious needs of more than 1.5 billion (and ever-increasing) people of the world and (arguably) is very pragmatic for ~~both operational and strategic implementation and monitoring both local producers and exporters alike~~. This paper will ~~define halal integrity and~~ attempt to conceptualise the context of halal using the farm to fork and global supply chain models to define halal integrity-develop operational and strategic conceptual frameworks. The ~~frameworks-models~~ will assist food manufacturers, food traders and policy makers to ensure the halal integrity of the local and global food supply chains.

Insert Table 1 here

#### Methodology

A desktop review of priori literature ~~on primary religious and academic sources were conducted and~~ ~~m~~Media reports of cross contamination of halal food products and fraud-related cases were collated to present the data (~~in~~ Table 1). The literature research was conducted by using various databases like EBSCO, Science Direct, Taylor and Francis Online and news. Keywords such as pork or porcine detection, halal food, haram and mislabelling were used in the databases. -in order to acquire a coherent narrative on emerging themes and trends- This is followed by a critical independent analysis to conceptualise integrity in the context of halal present two conceptual frameworks that are embracive of the religious needs of Muslim customer market using a farm to fork model and a global supply chain model. SWOT analyses were carried out to demonstrate the internal (i.e. strengths and weaknesses) and external environments (i.e. opportunities and threats) faced during international halal food trade. -The models are then used to define halal integrity.

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**Halal**

The halal and haram are clear as is seen in a number of Qur'anic verses. Table 2 shows examples of verses related to eating. Some foods, however, are mashbūh (doubtful), which is often the most controversial, since the standards classifying materials as doubtful are more subjective. Examples of permitted, prohibited and mashbūh foods are provided in Tables 3 and 4.

Insert Table 2 here

Insert Table 3 here

Insert Table 4 here

**Halal food supply chain (operational level)**

A halal food supply chain starts with sourcing various permitted raw materials and preparing them accordingly (e.g. such as, proper halal slaughter and no cross-contamination with haram products). During all stages of halal production, it is crucial that the food is sourced lawfully, i.e., free from corruption, dishonesty and with no malicious intention (Figure 1). For example, only permitted species are farmed and these halal species do not consume haram feed provided by humans. However, if eaten naturally, then this is not an issue. The schematic diagram below highlights the different stages where halal integrity needs to be considered and preserved (Figure 1).

Insert Figure 1 here

Many of the major stages found in the food supply chain (Soon and Baines, 2013; Soon *et al.*, 2012) are identified below alongside pertinent notions of halal and its impact on that phase.

Agricultural Phase: The inputs (e.g. such as seedlings, plantlets, fertilisers, pesticides, irrigation water, feed, and veterinary products) used during this phase need to be sourced and used according to legal requirements. Irrigation water for produce and crops, drinking water in animal husbandry production, and water sources from where aquaculture products are grown/marine products (including freshwater fish) are caught should be safe and not within the vicinity of pig farms or run-off from pig farms.

Slaughtering Phase: It is permitted to slaughter animals without stunning to meet Jewish and Muslim religious requirements (EU, 1993). The slaughtering phase is a key stage as differentiation between halal and non-halal meat occurs at this point (Bergeaud-Blackler 2007). According to Lever and Miele (2012), the practice of religious slaughter in this case addresses the qualification of halal and is

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3 115 comparable to other credence attributes that refer to the method of production rather than the  
4 116 intrinsic characteristics of the product. Hence all operations that occur downstream should guarantee  
5 117 the separation and integrity of halal products (Bergeaud-Blackler 2007). For halal it is required to use  
6 118 the Islamic method provided that the animals are slaughtered by a Muslim slaughterman. The Muslim  
7 119 slaughter person must be an adult male or female of sound mind familiar with the process of  
8 120 slaughtering. A trained slaughter person will be more efficient and will minimize the damage to the  
9 121 skin and carcass (Riaz and Chaudry, 2004). It is an absolute requirement that animals are  
10 122 slaughtered according to the halal method. The Muslim slaughter person must sever the front part of  
11 123 the neck, severing carotids, jugulars, trachea and esophagus without reaching the bone in the neck  
12 124 while pronouncing the name of God and with a swift blow (Riaz and Chaudry, 2004). It is preferable  
13 125 to turn the animal or bird towards Makkah (Mecca) before slaughtering although this is only a  
14 126 secondary requirement. The slaughtering of ruminants and poultry should preferably be done by  
15 127 hand. It is mandatory to pronounce the name of God while slaughtering the animal. It suffices to say  
16 128 Bismillah (in the name of God) once (Riaz and Chaudry, 2004). However, in general practice,  
17 129 especially for large animals, the slaughter person pronounces the name thrice as Bismillah Allahu  
18 130 Akbar, Bismillah Allahu Akbar (Riaz and Chaudry, 2004).

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20 132 Processing Phase: This often involves two sub-processes – assembling the materials needed and the  
21 133 actual processing of these materials. All ingredients including processing aids and materials used with  
22 134 food contact surfaces as well as the equipment must be halal, sourced legally, safe, and used  
23 135 according to legal requirements. Packaging and labelling must be clear and honest (i.e., no  
24 136 adulteration or mislabelling) (Ballin *et al.*, 2009; Ballin, 2010).

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26 138 Storage Phase: It is important that products are stored and segregated from haram products to avoid  
27 139 cross-contamination. What is acceptable “segregation” is the responsibility of the halal certifying  
28 140 agency. Food packaging (ranging from primary, secondary and tertiary packaging) play a role in  
29 141 ensuring products are kept sealed to reduce potential contamination.

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31 143 Logistics: Throughout the food supply chain, the logistics service provider plays a crucial role in  
32 144 ensuring that the raw materials, ingredients, packaging materials, storage and transportation of halal  
33 145 products is done so that they do not become contaminated with haram products.

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35 147 Audit: The traceability of halal products requires proper tracking of the actual product and  
36 148 certification of its halal status by a local Islamic authority and/or a reputable certification body. The  
37 149 drive for profit should not lead to compromising of the halal integrity. Although audit can only provide  
38 150 a snapshot of compliance with halal requirements, it is not feasible for any authority to monitor the  
39 151 whole chain, hence the need to have faith in the wholesomeness of the product (Alqudsi, 2014).

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153 | Figure 1 illustrates the application of halal integrity at the local operational level within a food  
154 | production (i.e. animal husbandry, aquaculture) or processing.—However, as the halal food trade and  
155 | personal travel increases, how can the authenticity of the halal status of a food product be assured?  
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### 157 | ***Halal Global Supply Chain (strategic-level)***

158 | The question of authenticity is paramount to this debate particularly as the halal food trade and travel  
 159 | increases. The global halal food trade is primarily linked with the rise in the global Muslim population  
 160 | and the increase of transnational trade. In 2010, there were 1.6 billion Muslims with a projected  
 161 | growth to 2.2 billion people by 2030 at an average annual growth of 1.8% (Pew Research Center,  
 162 | 2011). ~~This will make the Muslim population just over one quarter of the world population,  
 163 | representing a 35% increase since 2010. Australia, Canada, Europe and U.S.A. are emerging with  
 164 | growing Muslim populations and as major markets for halal trade and consumption (Alqudsi, 2014).~~

165 | The rise in population will undoubtedly boost the growth of the halal consumer market and sales. In  
 166 | 2011, this halal product market was worth a staggering US \$2.3 trillion of which just over 50% of the  
 167 | market (US \$1.4 trillion) was for food and beverages (Ahmad *et al.*, 2011). ~~To be part of the market  
 168 | can be potentially beneficial for non-Muslim countries to have Halal certification and labelling (Demirci  
 169 | *et al.*, 2016; Ruzevicius, 2012). This equated in 2012 to just less than 17% of the global food and  
 170 | beverages market and is projected to rise to US \$1.8 trillion by 2018, capturing approximately 20% of  
 171 | the global market (Arab News, 2016). Further, with the growth of the Muslim population the halal  
 172 | travel industry is projected to grow too. In 2015 the "Muslim travel market was worth US \$145 billion  
 173 | with 108 million Muslim travellers representing 10% of the entire travel economy." This halal tourism  
 174 | market is projected to grow to US \$200 billion by 2020 representing over 13% of the tourism market  
 175 | and this will further increase the need for halal food and beverages (Halal Tourism, 2015).~~

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 177 | With the expected growth of the halal food sector, the issue of global sourcing of raw materials and  
 178 | ingredients will require new efforts to assure halal traceability between countries. This is where  
 179 | traceability, identity preservation techniques, and the integrity of the halal certifying bodies can all  
 180 | contribute. As also noted by the Codex Alimentarius Commission (CAC/GL 24 – 1997), the term halal  
 181 | is subjected to different interpretations by the different schools of thought or jurisprudence –  
 182 | particularly Shāfī , Hanbalī , Mālikī , Hanafī in the Sunni tradition. But they do not differ with respect  
 183 | to haram. The differences between the legal schools of thought revolve around technicalities that  
 184 | must be respected.

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 186 | It should be noted that there is unanimous agreement regarding what constitutes a most perfect  
 187 | slaughter. This is the requirement for a healthy and alive lawful animal to be slaughtered by a  
 188 | Muslim reciting '*In the name of Allah, Allah is the Greatest*' cutting all four tubes or vessels – trachea,  
 189 | esophagus and both external jugular veins, although the question of reversible stunning remains  
 190 | controversial. Beyond the extent of permitted reversible stunning, differences exist about the details of  
 191 | which tubes in the neck need to be cut. Imām Shāfī is of the view that it is obligatory to cut the  
 192 | trachea and the esophagus whilst the dominant view of Imām Mālik is to cut into the trachea and  
 193 | both external jugular veins. Imām Ahmad b. Hanbal has two views reported. One stipulates all four  
 194 | tubes being cut and the other is in agreement with Imām Shāfī. Imām Abu Hanīfā is of the opinion

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3 195 that three of the four tubes, irrespective of whichever three, should be cut. To this end, there is also  
4 196 agreement on the cutting point (where the throat meets the upper part of the chest) and the need to  
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6 197 cut a minimum of two tubes (Uthmāni Mufti, 2006).  
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9 199 Whilst there are differences regarding secondary details, there is agreement on the need to allow  
10 200 blood to first flow out of the live animal (Regenstein and others 2003; Qu'ran 6:145; Uthmani 2006).  
11 201 Because of these differences, Kamali (2008) suggested the setting up of an international Shariah  
12 202 advisory forum to develop a leadership role in dealing with this issue and similar issues, and to advise  
13 203 on and resolve areas to minimise differences. These types of international standards may assist in the  
14 204 harmonisation and recognition of halal standards. Whilst it would be helpful to achieve some degree  
15 205 of harmonisation and recognition of halal standards, the practicalities are much more complex and  
16 206 can become politicised to where there is an effort to impose a secular view on the religious  
17 207 communities. An example of such an attempt to tell the religious communities that believe in religious  
18 208 slaughter what to do was an EU funded project. The Religious Slaughter: Improving Knowledge and  
19 209 Expertise through Dialogue and Debate on Issues of Welfare, Legislation and Socio-economic Aspects  
20 210 (DIALREL) ([www.dialrel.eu](http://www.dialrel.eu)) was carried out to provide a platform to share and address issues  
21 211 relating to religious slaughter between stakeholders and interested parties in 2006-2010 (DIALREL  
22 212 2010). But, this attempt was not seen as a dialogue rather it was received as a monologue and  
23 213 imposition of secular thought with limited attention given to religious slaughter practices and  
24 214 engagement with religious communities (Regenstein, 2010).  
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33 216 The key to improved halal integrity in international trade is transparency so that consumers can make  
34 217 informed decisions (Alqudsi 2014; Farouk *et al.* 2016). The certifying agency located and supervising  
35 218 in one country must clearly define the standards used for any particular product, especially with  
36 219 respect to slaughter. It must also assure that the company/slaughter/products comply with the  
37 220 standard it has announced. In many cases agencies will certify products using different standards for  
38 221 different countries and thus the certifying agencies need to also be sure to maintain product integrity  
39 222 and only send a product to a receiver under a different certifying agency that meets that agency's  
40 223 standard (Figure 2). Halal standards are used to make halal production more unambiguous (van der  
41 224 Spiegel *et al.*, 2012). Ideally the role of governments as accreditation bodies is to assure that the  
42 225 companies and the certifying agencies are saying what they do and doing what they say. Having  
43 226 governments staying out of certification but focusing on accreditation means that the Muslim citizens  
44 227 in any one country will have access to products that meet their different standards and the certifying  
45 228 agencies can compete to best serve consumers. In practice this generally means that competing  
46 229 certifying agencies tend to help police each other.  
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55 231 Insert Figure 2 here

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3 233 There are different interpretations of halal by the different schools of thought and these are modified  
4 234 by the customs of different countries. Figure 2 raises the issue of where a local Islamic authority's  
5 235 halal certificate is not recognised by an agency in a different country. Even with the adoption of a  
6 236 standardised or benchmarked halal standard, countries or certification bodies may still choose to  
7 237 remain independent. A certification body such as JAKIM from Malaysia recognises [54 certification](#)  
8 238 [bodies from 32 foreign halal certification bodies countries](#) and 4 authorities but delisted 4 certification  
9 239 bodies (Halal Malaysia Official Portal 2016). But are those rejections based on alternate  
10 240 interpretations of halal, non-compliance with halal requirements, or a political decision? In addition to  
11 241 cross recognition of halal certification bodies, at times local government bodies do not have the  
12 242 resources to carry out inspections globally and are required to outsource responsibilities to Muslim  
13 243 organisations around the world such as Islamic Food Council of Europe (IFCE) and Islamic Food and  
14 244 Nutrition Council of America (IFANCA) to carry out inspections. This triggers a transnational  
15 245 governmentality on a global scale (Fischer, 2016).  
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17 247 Thus governments are encouraged to take on the accreditation role to strengthen the whole system,  
18 248 while removing themselves from certification. There are attempts to harmonize halal standards which  
19 249 may benefit the food trade and operational efficiency across countries. [Analyses of harmonisation or](#)  
20 250 [maintaining independent halal standards will result in different strengths, weaknesses, opportunities](#)  
21 251 [and threats. SWOT analyses were divided into two categories in Figure 2 to provide a guideline for](#)  
22 252 [countries that opt to select standardised halal standard or choose to have an independent halal](#)  
23 253 [standard certification. Countries that opt to use standardised halal standard may benefit from](#)  
24 254 [increased cost efficiency and increased food trade.](#) However, there are also threats that there will be  
25 255 reduced variety and freedom of practise according to different schools of thought. [Countries that](#)  
26 256 [choose to use independent halal standards may benefit from increased competition and the potential](#)  
27 257 [to save cost as no benchmarking is required.](#) Meanwhile, although independent halal standards  
28 258 ensure the freedom to adopt halal practices according to their school of thought (and the country's  
29 259 tradition), a reduction in food trade and lack of food choices may prevail. ~~[Analyses of harmonisation](#)~~  
30 260 ~~[or maintaining independent halal standards will result in different strengths, weaknesses,](#)~~  
31 261 ~~[opportunities and threats.](#)~~ Hence, Figure 2 is presented as a [strategic global halal supply chain](#) model  
32 262 to provide pragmatic information for countries or certification bodies to better serve Muslims with  
33 263 different traditions. [However, the SWOT analyses serve as a guideline as Ab Talib and Abdul Hamid,](#)  
34 264 [\(2014\) reported that SWOT analysis done may be outdated as the environments are constantly](#)  
35 265 [changing. In addition to relying on halal standards and certification, laboratory analyses can be used](#)  
36 266 [to monitor specific haram ingredients in raw materials and food products such as the presence of](#)  
37 267 [porcine and alcohol \(van der Spiegel et al., 2012\), identification of animal species in food \(Aida et al.,](#)  
38 268 [2005, 2007\) and origin of food product \(Ebeler, 2007\). According to Fauzi and Mas'ud \(2009\)](#)  
39 269 [scientific justification and results of laboratory analyses can provide additional information for local](#)  
40 270 [and regional Islamic authorities to evaluate the halal status of the products.](#)

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273 One step to better cooperation but while maintaining minor differences related to the schools is the

274 halal standard developed by the Turkish Halal Certification Centre (GIMDES) that incorporates

275 different Schools of Islamic law. A tick (✓) image in the logo can be added beside the appropriate

276 schools of law (i.e. Shāfī, Hanbalī, Mālikī, Hanafī) according to which rules the certified company

277 has complied (Figure 3). The certification can represent one or even all of the schools of law

278 (GIMDES, 2015). But given that Turkey is predominantly a Sunni country, to date this form of

279 certification does not address the Shi'a schools. It also implies that the application of standards by

280 schools is sufficient. In some cases, e.g., where fish are considered halal, it is apparent that there

281 are also different customs in different countries that reflect the different schools but lead to

282 differences within each school.

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284 Insert Figure 3 here

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286 Malaysia recognizes the significance of halal assurance of food and consumer products produced

287 globally. It currently accepts products and premises certified by a number of Islamic certification

288 bodies and authorities. Globally, JAKIM recognizes 54 foreign halal certification bodies (Halal Malaysia

289 Official Portal, 2016). Additionally, JAKIM recognizes 4 national authorities that will be able to provide

290 guidance for consumers when purchasing halal goods or patronizing certain premises overseas (Halal

291 Malaysia Official Portal, 2016). It should be noted that Malaysia is one of the few Muslim countries

292 that recognizes percussive stunning as acceptable for reversible stunning (Halal Malaysia Official

293 Portal, 2016).

294

### 295 Halal Integrity

296 A farm to fork food supply chain is not only concerned about food but also the origin, transparency,

297 potential for fraud and adulteration, increasing consumers' confidence, traceability (traceback and

298 track forward) and quality issues (Hoorfar et al. 2011). Manning and Soon (2014) suggested that the

299 term food integrity should be used to describe foods that are properly represented for exactly what

300 they are. So halal integrity would be again clearly presenting the details of the halal status of the

301 product and assuring that the requirements for halal as stated are met. Food safety is part of halal

302 integrity as wholesomeness (tayyab) is a parallel requirement for halal, i.e., food should be pure,

303 lawful and good for human consumption. Zulfakar *et al.* (2014) proposed a conceptual framework for

304 halal food supply chain integrity which encompasses protective and preventive measures to ensure

305 food products remain halal from production until they reach consumers. Halal integrity should also

306 demonstrate that the product remain halal throughout the supply chain, are free from any activities

307 that might breached the halal status (intentionally or unintentionally) (Zulfakar et al. 2012). Others

308 are proposing more specific halal control points (Kohilavani *et al.* 2012; Kohilavani *et al.* 2013),

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3 309 control points for halal slaughtering of poultry (Shahdan *et al.*, 2016) and halal compliance critical  
4 310 control point (Kamaruddin *et al.* 2012) for various production systems. There are certainly challenges  
5 311 in ensuring halal integrity in the food supply chain as production, processing and transportation  
6 312 require different companies at various stages. Alqudsi (2014) had reported that it is a difficult task to  
7 313 maintain halal integrity of the whole supply chain as it requires constant monitoring and resources in  
8 314 terms of capital and trained staff. However, the demand for halal food products from consumers and  
9 315 the drive from the supply side theory of religion (i.e. expansion of halal markets because of  
10 316 production sides' initiative in creating more halal food) will spur the need to ensure halal food status  
11 317 is maintained. Halal certification bodies play an important role in certifying halal food products and  
12 318 services whilst governments should play an active role as accreditation bodies or to provide  
13 319 independent validation in order to police the halal food chain. If halal integrity is maintained **at the**  
14 320 **operational level** across the supply chain regardless of whether the chain is within one country or  
15 321 multiple countries, then one will have a global halal supply chain with integrity (Figure 2). Halal  
16 322 integrity is crucial to the success of the emerging halal market. A formal definition of halal integrity  
17 323 might be articulated as:

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26 325 *'the assurance of safe (pure), quality (good) and free from mal-practice (lawful) food from farm to*  
27 326 *fork'*

## 328 329 **Conclusion**

330 The ideas of halal and haram are clear within Islamic teachings. It is important also to understand  
331 that halal is a way of life and embraces good conduct and righteous deeds. It is in this context that  
332 halal integrity should be understood. This paper utilises the farm to fork and global supply chain  
333 models to foster a critical awareness of halal needs. Taking into consideration the origins of food  
334 products, production and facilities (~~i.e. operational level~~), global sourcing of ingredients and raw  
335 materials, food trade and halal as a way of life leads to a definition of halal integrity. SWOT analyses  
336 serve as a guideline for countries that opt to select standardised halal standard or choose to have an  
337 independent halal standard certification. Countries that opt to use standardised halal standard may  
338 benefit from increased cost efficiency and increased food trade while countries that choose to use  
339 independent halal standards may benefit from increased competition and the potential to save cost as  
340 no benchmarking is required. It is recommended that the key to improved halal integrity in  
341 international trade is transparency and required concerted effort from food supply chains, policy  
342 makers, halal certification & accreditation bodies and research institutions. Halal integrity is crucial to  
343 the success of halal market – if the halal status of the food product is breached (e.g. did not follow  
344 halal slaughtering method, cross contamination with haram products, ill intentions), this will render  
345 the product haram. In response to the initial questions raised in this paper, i.e., what is halal  
346 integrity and what measures can be taken to assure this – a formal definition of halal integrity has

347 | been proposed. ~~Halal integrity is need both operationally and strategically to ensure that the halal~~  
 348 | ~~status of food products remains intact.~~

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## 350 | **References**

351

352 | Ab Talib, M. S. and Abdul Hamid, A. B. (2014), "Halal logistics in Malaysia: a SWOT analysis", *Journal*  
 353 | *of Islamic Marketing*, Vol. 5, No. 3, pp. 322-343.

354

355 | Adam, M. (2016), "The fiqh of halal and haram animals", available at [http://www.central-](http://www.central-mosque.com/index.php/General-Fiqh/the-fiqh-of-halal-and-haram-animals.html)  
 356 | [mosque.com/index.php/General-Fiqh/the-fiqh-of-halal-and-haram-animals.html](http://www.central-mosque.com/index.php/General-Fiqh/the-fiqh-of-halal-and-haram-animals.html) (accessed 12 March  
 357 | 2016).

358

359 | Ahmad, H., Fazlullah, A., Borham, A.J., Hashim, H. and Razak, M.A. (2011), "Halal studies in  
 360 | universities: A way forward to manage halal business", *International Journal of Arts and Science*  
 361 | *Conference* (IJAS2011) 3 June, Austria.

362

363 | Aida, A. A., Che Man, Y. B., Raha, A. R. and Son, R. (2007), "Detection of pig derivatives in food  
 364 | products for halal authentication by polymerase chain reaction-restriction fragment length  
 365 | polymorphism", *Journal of the Science of Food and Agriculture*, Vol. 87, No. 4, pp. 569-572.

366

367 | Aida, A. A., Che Man, Y. B., Wong, C. M. V. L., Raha, A. R. and Son, R. (2005), "Analysis of raw  
 368 | meats and fats of pigs using polymerase chain reaction for Halal authentication", *Meat Science*, Vol.  
 369 | 69, No. 1, pp. 47-52.

370

371 | Al-Bukhārī, M. (trans. Muḥammad Muḥsin Khān) (n.d.), *The Translation of Meanings of Al-Sahīḥ al-*  
 372 | *Bukhārī*, (vol. 1-9), Dār al-Fikr, Beirut, Lebanon.

373

374 | Al-Mawsu'a al-fiqh al-Kuwaitiyyah (n.d.). vols. 1-45. Wizaratul al-awqaaf wa al-sh'awn al-Islamiyyah  
 375 | 1404/1984 – 1427/2006

376

377 | Al-Qardawi, Y. (2013) (trans.). El-Helbawy *et al.* *The Lawful and The Prohibited in Islam*, Kuala  
 378 | Lumpur: Islamic Book Trust

379

380 | Al-Qazwini, M. (n.d.) *Sunan Ibn Mājah*, Kitāb al-Aṭ'imah, Chapter 31, Hadith 3314, (vols. 1-2), p.  
 381 | 1102, Dār al-'Ilmiyyah, Beirut, Lebanon.

382

383 | Alqudsi, S. G. (2014), "Awareness and demand for 100% halal supply chain meat products", *Procedia*  
 384 | *– Social and Behavioral Sciences*, Vol. 130, pp. 167-178.

385

386 | Al-Zuhayli, W. (2002) (vol. 4) *Al-Fiqh al-Islam wa Adilatuhu*, Syria: Damascus: Dar al-Fikr, pp. 2790-  
 387 | 2792]

388

389 | Arab News (2016), "Halal food market grows to \$1.1 trillion industry", available at  
 390 | <http://www.arabnews.com/news/economy/614871> (accessed 12 March 2016).

391

392 | Ballin, N. Z. (2010), "Authentication of meat and meat products", *Meat Science*, Vol. 86, No. 3, pp.  
 393 | 577-587.

394

395 | Ballin, N. Z., Vogensen, F. K. and Karlsson, A. H. (2009), "Species determination – Can we detect and  
 396 | quantify meat adulteration?" *Meat Science*, Vol. 83, No. 2, pp. 165-174.

397

398 | BBC News (2013), "Leicester schools halal lamb burger contained pork", 9 May, available at:  
 399 | <http://www.bbc.com/news/uk-england-leicestershire-22466068> (accessed 3 April 2015).

400

401 | BBC News (2013), "Leicestershire schools' flu vaccine contains gelatine", 17 September, available at  
 402 | <http://www.bbc.com/news/uk-england-leicestershire-24113970> (accessed 3 April 2015).

- 1  
2  
3 403  
4 404 Bergeaud-Blackler, F. (2007), "New challenges for Islamic ritual slaughter: A European perspective",  
5 405 *Journal of Ethnic and Migration Studies*, Vol. 33 No. 6, pp. 965-980.  
6 406  
7 407 Bottaro, M., Marchetti, P., Mottola, A., Shehu, F. and Pinto, A. (2014), "Detection of mislabeling in  
8 408 packaged chicken sausages by PCR", *Albanian Journal of Agricultural Sciences*, Special Edition (2014),  
9 409 pp. 455-460.  
10 410  
11 411 CAC, Codex Alimentarius Commission (1997), *CAC/GL 24-1997 General guidelines for use of the term*  
12 412 *"Halal"*, Codex Alimentarius Commission.  
13 413  
14 414 Cawthorn, D.-M., Steinman, H. A. and Hoffman, L. C. (2013), "A high incidence of species substitution  
15 415 and mislabelling detected in meat products sold in South Africa", *Food Control*, Vol. 32, No. 2, pp.  
16 416 440-449.  
17 417  
18 418 Chandia, M. (2015), *Translation of the Holy Qur'an*, Azhar Academy, London.  
19 419  
20 420 Demirci, M. N., Soon, J. M. and Wallace, C. A. (2016), "Positioning food safety in halal assurance",  
21 421 *Food Control*, Vol. 70, pp. 257-270.  
22 422  
23 423 Demirhan, Y., Ulca, P. and Senyuva, H. Z. (2012), "Detection of porcine DNA in gelatine and gelatine-  
24 424 containing processed food products – Halal/Kosher authentication," *Meat Science*, Vol. 90, No. 3, pp.  
25 425 686-689.  
26 426  
27 427 DIALREL (2010), "Encouraging dialogue on issues of religious slaughter", available at:  
28 428 <http://www.dialrel.eu/> (accessed 24 January 2016).  
29 429  
30 430 Doosti, A., Ghasemi Dehkordi, P. and Rahimi, E. (2011), "Molecular assay to fraud identification of  
31 431 meat products", *Journal of Food Science and Technology*, Vol. 51 No. 1, pp. 148-152.  
32 432  
33 433 Di Pinto, A., Bottaro, M., Bonerba, E., Bozzo, G., Ceci, E., Marchetti, P., Mottola, A. and Tantillo, G.  
34 434 (2015), "Occurrence of mislabelling in meat products using DNA-based assay", *Journal of Food*  
35 435 *Science and Technology*, Vol. 52, No. 4, pp. 2479-2484.  
36 436  
37 437 Di Pinto, A., Forte, V. T., Conversano, M. C. and Tantillo, G. M. (2005), "Duplex polymerase chain  
38 438 reaction for detection of pork meat in horse meat fresh sausages from Italian retail sources", *Food*  
39 439 *Control*, Vol. 16, No. 5, pp. 391-394.  
40 440  
41 441 Ebeler, S. E. (2007), "Enantiometric analysis as a tool for authentication of foods and beverages", In,  
42 442 Ebeler, S. E., G. R. Takeoka and P. Winterhalter (Eds.). *Authentication of food and wine*, Vol. 952, pp.  
43 443 39-49.  
44 444  
45 445 Eliasi, J. R. and Dwyer, J. T. (2002), "Kosher and halal: Religious observances affecting dietary  
46 446 intakes", *Journal of the American Dietetic Association*, Vol. 102 No. 7, pp. 911-913.  
47 447  
48 448 EU (1993), "Council directive 93/119/EC of 22 December 1993 on the protection of animals at the  
49 449 time of slaughter or killing", Available at: [http://ec.europa.eu/food/fs/aw/aw\\_legislation/slaughter/93-](http://ec.europa.eu/food/fs/aw/aw_legislation/slaughter/93-119-ec_en.pdf)  
50 450 [119-ec\\_en.pdf](http://ec.europa.eu/food/fs/aw/aw_legislation/slaughter/93-119-ec_en.pdf) [Accessed 7 June 2016]  
51 451  
52 452 Farouk, M. M., Pufpaff, K. M. and Amir, M. (2016), "Industrial halal meat production and animal  
53 453 welfare: A review", *Meat Science*, doi: [doi:10.1016/j.meatsci.2016.04.023](https://doi.org/10.1016/j.meatsci.2016.04.023)  
54 454  
55 455 Fauzi, A. M. and Mas'ud, Z. A. (2009), "Instrumentation techniques for potential application in halal  
56 456 products authentication. 3<sup>rd</sup> IMT-GT International Symposium on Halal Science and Management, 21-  
57 457 22 December 2009, Kuala Lumpur, Malaysia.  
58 458

- 1  
2  
3 459 Fischer, J. (2016), "Markets, religion, regulation: Kosher, halal and Hindu vegetarianism in global  
4 460 perspective," *Geoforum*, Vol. 69: 67-70.  
5 461  
6 462 Flores-Munguia, M. E., Bermudez-Almada, M. C. and Vazquez-Moreno, L. (2000), "A research note:  
7 463 Detection of adulteration in processed traditional meat products", *Journal of Muscle Foods*, Vol. 11,  
8 464 No. 4, pp. 319-325.  
9 465  
10 466 GIMDES (2015), "GIMDES certification standards", available at:  
11 467 <http://www.halalcertificationturkey.com/en/certification-information/certification-standarts/> (accessed  
12 468 15 January 2016).  
13 469  
14 470 Halal Malaysia Official Portal (2016), "The recognised foreign halal certification bodies and  
15 471 authorities", available at: [http://www.halal.gov.my/v4/index.php/en/badan-islam/badan-luar-negara-](http://www.halal.gov.my/v4/index.php/en/badan-islam/badan-luar-negara-diiiktiraf)  
16 472 [diiiktiraf](http://www.halal.gov.my/v4/index.php/en/badan-islam/badan-luar-negara-diiiktiraf) (accessed 13 January 2016).  
17 473  
18 474 Halal Tourism (2015), "150 million visitors worth \$200 billion: The story has just begun", available at:  
19 475 [http://www.guesthousesofmaldives.com/halal-tourism-150-million-visitors-worth-200-billion-the-story-](http://www.guesthousesofmaldives.com/halal-tourism-150-million-visitors-worth-200-billion-the-story-has-just-begun/)  
20 476 [has-just-begun/](http://www.guesthousesofmaldives.com/halal-tourism-150-million-visitors-worth-200-billion-the-story-has-just-begun/) (accessed 29 February 2016).  
21 477  
22 478 [Hoorfar, J., Jordan, K., Butler, F. and Prugger, R. \(2011\), "Food chain integrity: A holistic approach to](#)  
23 479 [food traceability, safety, quality and authenticity", Cambridge: Woodhead Publishing, pp. 1-338.](#)  
24 480  
25 481 Ibn Al-Hajjāj, M. (1987). *Saḥīḥ Muslim bi Sharh al-Nawawī, Kitāb al-Musāqah*, part 11, vol. 4 (first  
26 482 ed.), p. 27, Dar al-Rayyān, Cairo, Egypt.  
27 483  
28 484 Kamali, M. H. (2008), "Fiqh-based approach to harmonisation of halal standards", *The Halal Journal*  
29 485 (May & June), available at: [http://issuu.com/the-halal-](http://issuu.com/the-halal-journal/docs/mayjune2008__20100721_093430/25)  
30 486 [journal/docs/mayjune2008\\_\\_20100721\\_093430/25](http://issuu.com/the-halal-journal/docs/mayjune2008__20100721_093430/25) (accessed 15 January 2016).  
31 487  
32 488 Kamaruddin, R., Iberahim, H. and Shabudin, A. (2012), "Halal compliance critical control point  
33 489 (HCCCP) analysis of processed food", *IEEE Business, Engineering & Industrial Applications Colloquium*  
34 490 (BEIAC), pp. 383-387.  
35 491  
36 492 Kohilavani, Yang, T. A., Febrianto, N. A., Abdullah, W. and Tajul Aris, A. (2012), "A decision tree  
37 493 based approach for the identification of Halal Critical Control Points for slaughtering according to  
38 494 Islamic dietary law", *Internet Journal of Food Safety*, Vol. 14, 48-53.  
39 495  
40 496 Kohilavani, Zzaman, W., Febrianto, N., Zakariya, N., Abdullah, W. and Yang, T. (2013), "Embedding  
41 497 Islamic dietary requirements into HACCP approach", *Food Control*, Vol. 34 No. 2, 607-612.  
42 498  
43 499 Lever, J. and Miele, M. (2012), "The growth of halal meat markets in Europe: An exploration of the  
44 500 supply side theory of religion", *Journal of Rural Studies*, Vol. 28, pp. 528-537.  
45 501  
46 502 Lipes, J. (2013), "Foods mislabeled as halal imports", 18 January, *Radio Free Asia*, available at:  
47 503 <http://www.rfa.org/english/news/uyghur/halal-01182013161229.html> (accessed 3 April 2015).  
48 504  
49 505 Manning, L and Soon, J.M. (2014), "Developing systems to control food adulteration", *Food Policy*,  
50 506 Vol. 49 No. 1, pp. 23-32.  
51 507  
52 508 Muñoz-Colmenero, M., Martinez, J., Roca, A. and Garcia-Vazquez, E. (2016), "Detection of different  
53 509 DNA animal species in commercial candy products", *Journal of Food Science*, Vol. 81, No. 3, pp.  
54 510 T801-T809.  
55 511  
56 512 Muslim Food Board (2016), "Importance of halal diet", available at:  
57 513 <http://www.tmfboard.net/component/tags/tag/30-doubtful> (accessed 26 March 2016).  
58 514  
59  
60



- 1  
2  
3 515 Pew Research Center (2011), "The future of the global Muslim population: Projections for 2010-  
4 516 2030", available at [http://www.pewforum.org/files/2011/01/FutureGlobalMuslimPopulation-WebPDF-](http://www.pewforum.org/files/2011/01/FutureGlobalMuslimPopulation-WebPDF-Feb10.pdf)  
5 517 Feb10.pdf (accessed 12 March 2016).  
6 518
- 7 519 Press Association (2015), "Abattoir clips highly regrettable", 3 February, *Daily Mail*, available at:  
8 520 <http://www.dailymail.co.uk/wires/pa/article-2937224/Halal-slaughterhouse-video-probed.html>  
9 521 (accessed 13 April 2015).  
10 522
- 11 523 RASFF, Rapid Alert System for Food and Feed (2013), "RASFF portal", available at:  
12 524 <https://webgate.ec.europa.eu/rasff-window/portal/?event=SearchForm&cleanSearch=1> (accessed 16  
13 525 January 2016).  
14 526
- 15 527 Riaz, M. N., and Chaudry, M. M. (2004). *Halal food production*. CRC Press, LCC., Boca Raton, FL, USA.  
16 528
- 17 529 Regenstein, J. M. (2010), "DIALREL recommendations: comments of Prof. Regenstein", available at:  
18 530 <http://www.asidcom.org/DIALREL-recommendations-comments.html> (accessed 15 March 2016).  
19 531
- 20 532 [Ruzevicius, J. \(2012\), "Products quality religious-ethical requirements and certification. Economics and](#)  
21 533 [Management, Vol. 17, No. 2, pp. 761-767.](#)  
22 534
- 23 535 SGS (2011), "Comparing Global Food Safety Initiative (GFSI) recognised standards", available at:  
24 536 [http://www.sgs.com/~media/Global/Documents/White%20Papers/sgs-global-food-safety-initiative-](http://www.sgs.com/~media/Global/Documents/White%20Papers/sgs-global-food-safety-initiative-whitepaper-en-11.ashx)  
25 537 whitepaper-en-11.ashx (accessed 15 January 2016).  
26 538
- 27 539 Shahdan, I. A., Regenstein, J. M., Shahabuddin, A. S. M. and Rahman, M. T. (2016). "Developing  
28 540 control points for halal slaughtering of poultry", *Poultry Science* doi: 10.3382/ps/pew092  
29 541
- 30 542 Soares, S., Amaral, J. S., Oliveira, M. B. and Mafra, I. (2013), "A SYBR green real-time PCR assay to  
31 543 detect and quantify pork meat in processed poultry meat products", *Meat Science*, Vol. 94, No. 1, pp.  
32 544 115-120.  
33 545
- 34 546 Soon, J. M. and Baines, R. (2013). *Managing food safety risks in the agri-food industries*. Boca Raton:  
35 547 CRC Press.  
36 548
- 37 549 Soon, J. M., Manning, L., Davies, W. P. and Baines, R. (2012). "Fresh produce-associated outbreaks:  
38 550 a call for HACCP on farms?" *British Food Journal*, Vol. 114, No. 4, pp. 553-597.  
39 551
- 40 552 Trenwith, C. (2013), "Fast food giant to pay \$700k for halal mislabelling", *Arabian business*, available  
41 553 at: <http://m.arabianbusiness.com/fast-food-giant-pay-700k-for-halal-mislabelling-498543.html>  
42 554 (accessed 3 April 2015).  
43 555
- 44 556 Uthmani Mufti, T.M. (2005), "Legal rulings on slaughtered animals", trans. Nana, A., p. 13, available  
45 557 at <http://freepdfhosting.com/d3a6d6755e.pdf> (accessed 27 February 2016).  
46 558
- 47 559 [Van der Spiegel, M., van der Fels-Klerx, H. J., Sterrenburg, P., van Ruth, S. M., Scholtens-Toma, I. M.](#)  
48 560 [J. and Kok, E. J. \(2012\), "Halal assurance in food supply chains: Verification of halal certificates using](#)  
49 561 [audits and laboratory analysis", Trends in Food Science & Technology, Vol. 27, No. 2, pp. 109-119.](#)  
50 562
- 51 563 Whitworth, J. (2013), "FSA calls urgent meeting after pork DNA found in halal meat", 4 February,  
52 564 *Food Production Daily*, available at [http://www.foodproductiondaily.com/Safety-Regulation/FSA-calls-](http://www.foodproductiondaily.com/Safety-Regulation/FSA-calls-urgent-meeting-after-pork-DNA-found-in-halal-meat)  
53 565 urgent-meeting-after-pork-DNA-found-in-halal-meat (accessed 25 March 2015).  
54 566
- 55 567 [Zulfakar, M. H., Jie, F. and Chan, C. \(2012\), "Halal food supply chain integrity: From a literature](#)  
56 568 [review to a conceptual framework", 10<sup>th</sup> ANZAM Operations, Supply Chain and Services Management](#)  
57 569 [Symposium, Melbourne, Australia, 14-15<sup>th</sup> June 2012.](#)  
58 570  
59  
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55  
56  
57  
58  
59  
60

571 Zulfakar, M.H., Mohamed Anuar, M. and Ab. Talib, M.S. (2014), "Conceptual framework on halal food  
572 supply chain integrity enhancement", *Procedia – Social and Behavioural Sciences* Vol. 121, pp. 58-67.

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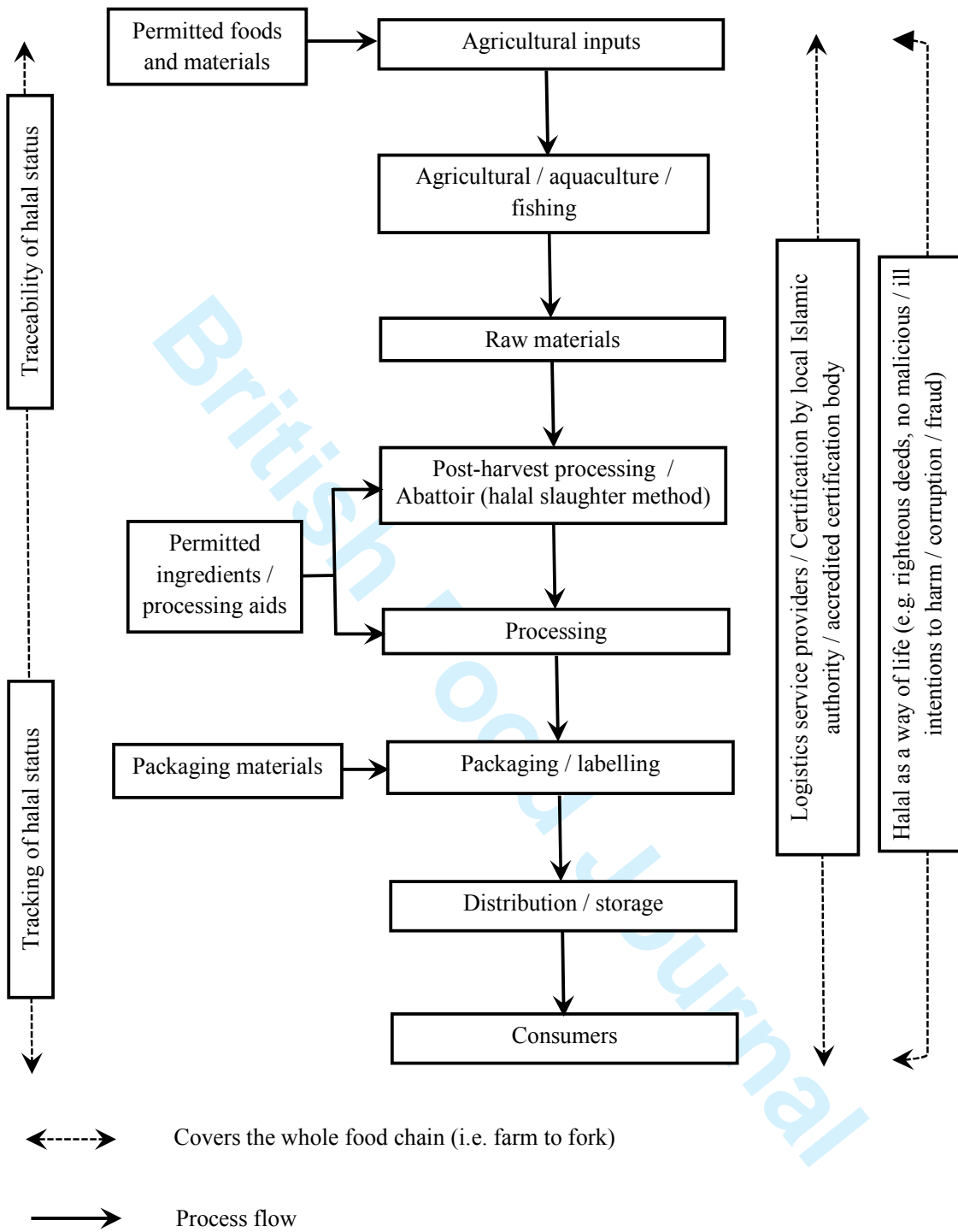


Figure 1. Halal integrity from farm to fork

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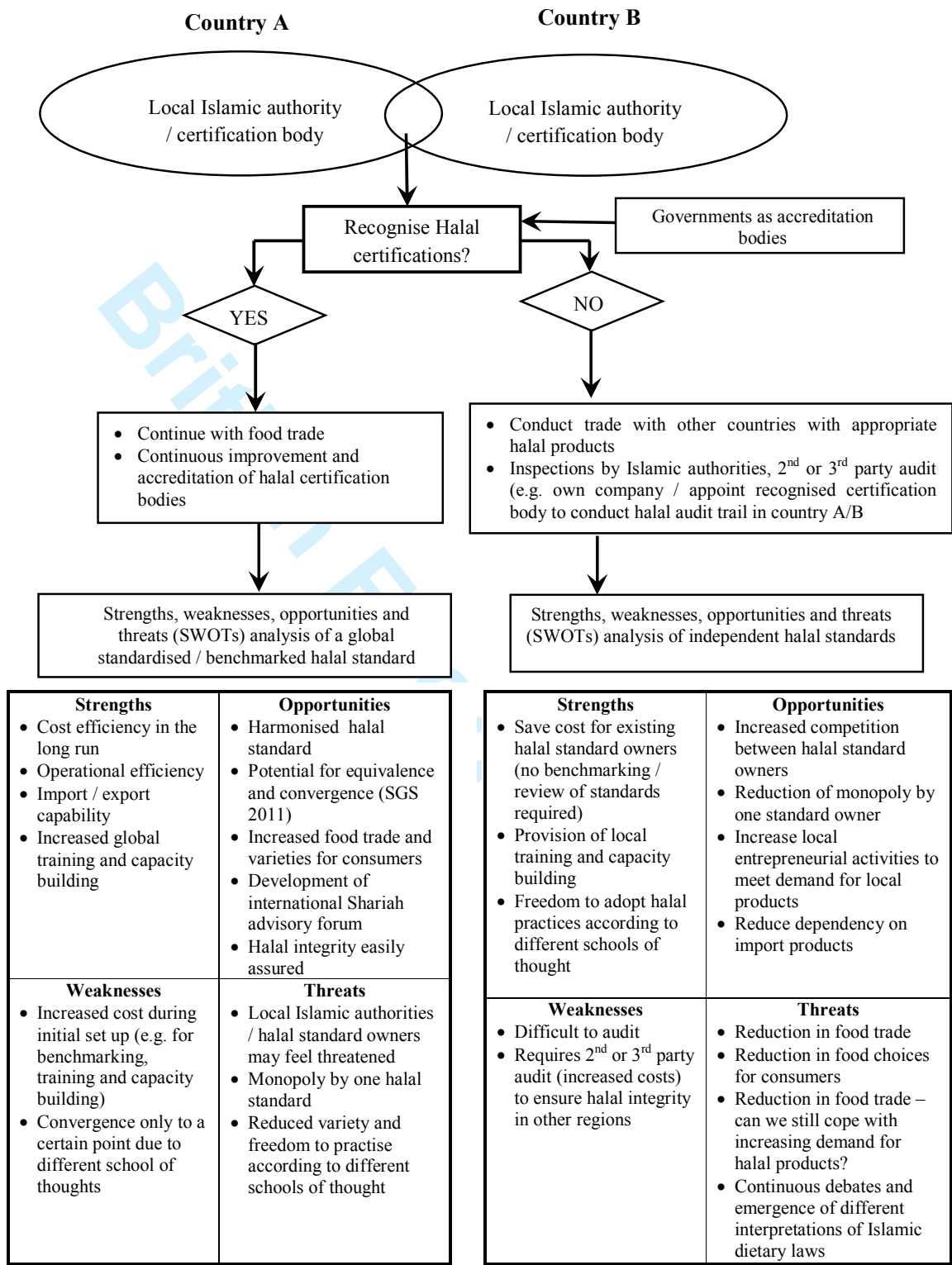


Figure 2. Assuring global halal integrity via recognised halal certification bodies



Figure 3. Example of a Halal certification that incorporates different Schools of Sunni Islamic Law (GIMDES, 2015)

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Table 1. Examples of food cross-contamination with porcine products and mislabeling cases

Year	Location	Item	Contaminant	References
2000	Mexico	Sausages and burger patties	Undeclared porcine species meat products	Flores-Munguía <i>et al.</i> , 2000
2005	Italy	Horsemeat sausages	Pork meat was added fraudulently in Italian horse fresh sausages	Di Pinto <i>et al.</i> , 2005
2011	Iran	Halal meats	Unlawful (adulterated) meats containing poultry, pig, donkey and horse meat	(Doosti <i>et al.</i> , 2011).
2013	South Africa	Minced meat, burger patties, deli meats, sausages and biltongs	Detection of porcine DNA in various meat products	Cawthorn <i>et al.</i> , 2013
2013	UK	Meat pies and pastries	Porcine DNA	(Whitworth, 2013)
2013	UK	Frozen burgers	Porcine DNA	(Whitworth, 2013)
2013	UK	Lamb burgers	Traces of pork	(BBC News, 9 May 2013)
2013	UK	Vaccine	Pork gelatin	(BBC News, 17 September 2013)
2013	US	Chicken sandwich	Mislabelled as halal	(Trenwith, 2013)
2013	China	Homemade food products	Mislabelled as halal	(Lipes, 18 January 2013)
2013	Hungary	Pork tenderloins	Pork tenderloins labelled as beef tenderloins	(RASFF, 2013)
2013	Portugal	Poultry meat	Possible cross contamination of poultry meat products with pork meat	Soares <i>et al.</i> , 2013
2014	EU	Packaged chicken	Mislabelled	(Bottaro <i>et al.</i> , 2014)

		sausages		
<u>2014</u>	<u>Turkey</u>	<u>Gelatine products (marshmallow and gum drops)</u>	<u>Products contain porcine gelatine and labelling failed to indicate the use of pork gelatine</u>	<u>(Demirhan et al., 2012)</u>
2015	UK	Halal slaughter house	Not following halal practices in the slaughtering process	(Press Association, 3 February 2015)
<u>2015</u>	<u>Italy</u>	<u>Chicken sausages</u>	<u>Detection of pork DNA in chicken sausages</u>	<u>Di Pinto et al., 2015</u>
<u>2016</u>	<u>Spain</u>	<u>Marshmallows, gummies, hard candies and complex candies</u>	<u>Detection of porcine DNA in commercial candy products</u>	<u>Muñoz-Colmenero et al., 2016</u>

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