

## CONSUMPTION OF STEM CELL MEAT: AN ISLAMIC PERSPECTIVE

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### ABSTRACT

Islam provides specific guidelines for meat production and consumption based on *halal* and hygiene laws. This study mainly focuses on the permissibility of emerging lab-cultivated meat from the Shari'ah perspective. It also examines the notion and significance of halal food (especially meat) within the purview of Islamic jurisprudence and assesses the position of lab-grown or stem cell meat for Muslim consumers. This work further highlights the underlying reasons behind the prohibition of haram food and it investigates the production process of in vitro meat to see whether it is done in accordance with Shari'ah guidelines. Furthermore, the study explores consumer rights to halal meat within the ambit of the Shari'ah. The objective of this research is to explore this new kind of meat and evaluate its legitimacy under Islamic law. This will hopefully create awareness in Muslim consumers and create an interest among researchers. The research adopts doctrinal research where the researcher consults relevant literature in the form of books, research articles and reports on the views of experts in the subject matter. This leads to the basic conclusion that whilst Islam supports the use of technology to improve human lives, such use needs to correspond to the promotion and protection of the *Maqasid al-Shari'ah*.

**Keywords:** Stem cell, *halal* and *haram*, in vitro meat, consumption, *Maqasid al-Shari'ah*.

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## PENGAMBILAN DAGING YANG DIHASILKAN DARI SEL INDUK (STEM CELLS): SUATU PERSPEKTIF ISLAM

### ABSTRAK

Islam menggariskan panduan khusus bagi penghasilan dan pengambilan daging yang berasaskan undang-undang *halal* dan memenuhi piawaian kebersihan yang tinggi. Kajian ini tertumpu kepada isu sama ada pengambilan daging yang dilakukan melalui proses di makmal adalah selamat pada perspektif Islam. Makalah ini turut memeriksa tanggapan dan kepentingan memastikan setiap makanan yang di ambil oleh pengguna-pengguna Muslim. Makalah ini akan menilai kedudukan daging yang dicipta di dalam makmal dan menentukan samada ianya bersesuaian untuk para pengguna Muslim. Makalah ini seterusnya memberi sorotan tentang sebab yang mendasari pengharaman makanan yang tertentu. Siasatan juga dibuat bagi memastikan samada proses pembuatan daging in vitro adalah memenuhi tuntutan Syariah. Selain dari itu, penyelidikan turut dilakukan bagi meneroka hak-hak pengguna untuk mendapatkan daging yang *halal*. Objektif utama penyelidikan ini ialah untuk menentukan samada daging yang dicipta ini adalah Halal dan selamat di makan. Adalah diharapkan hasil penyelidikan ini akan dapat memberi kesedaran kepada pengguna Muslim agar berhati-hati sebelum mengambil apa-apa jenis daging. Penyelidikan ini menggunakan kaedah penyelidikan secara doktrinal dimana penyelidik merujuk buku-buku, makalah penyelidikan dan laporan pakar dalam bidang yang berkaitan. Kesimpulan yang dapat dibuat dari kajian ini adalah walaupun Islam menggalakkan penggunaan teknologi bagi memperbaiki kehidupan, namun begitu ianya hendaklah sesuai dengan galakkan dan perlindungan *Maqasid al-Syariah*.

**Kata kunci:** daging dari sel induk (stem cell), Halal and Haram, pengambilan daging in vitro, *Maqasid al-Shari'ah*.

### INTRODUCTION

Stem cell meat is a new invention in the field of food and beverage. It is a kind of meat, which is cultivated artificially through a complex laboratory process. Researchers intend to present this new kind of meat to be available in the market for consumers within the next few years, possibly

by 2020.<sup>1</sup> This is heavily influenced by the success of Genetically Modified Organisms (GMOs) food. These foods apparently look attractive and taste like the natural version and may fulfil the demand of the consumers but at the same time it may bear certain unseen future risks in terms of food safety, nutrition and other long-term health problems. This is because the effect of these food, whether harmful or not, is still largely undiscovered.

The production and consumption of meat created from the stem cell of an animal through a laboratory process has raised jurisprudential debate as to whether the method of cultivating meat is permissible under the Shari'ah or whether such procedures should be prohibited as it contravenes the law of nature. The preservation of health or life (body and soul) is one of the most significant objectives of the Shari'ah (*Maqasid al-Shari'ah*) and *halal* food is a vital source of human energy and survival. In line with the purpose of Shari'ah, Islam not only guarantees on the building of a moderate civilization but also approves the consumption of a pure food (*halal al-tayyibah*) policy to safeguard human being from spiritual and physical afflictions. The paper is designed towards that end. It has been divided into three divisions. The first part focused on the concept and backdrop of stem cell meat and its production process while the second part discussed the *Maqasid al-Shari'ah* and Shari'ah principles of pure food and explored the permissibility of such meat in the eye of Shari'ah. The last part explains the issue of consumer's rights and remedies in case of a violation under Islamic law.

## **STEM CELL MEAT PRODUCTION: AN INTRODUCTION**

There are varieties of cells in the body of animals which are committed to fulfilling certain specialised functions. These are the muscle cells, pancreatic islet cells, red blood cells, nerve cells etc. Stem cells are, on the other hand, a unique and important set of cells that are not specialized

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<sup>1</sup> Rachel Reilly, "Lab-grown burgers will be on the menu by 2020: Scientists set up company to make stem cell meat an affordable reality", Mail Online, 5 February 2016, available at: <http://www.dailymail.co.uk>.

and have the ability to reproduce itself for longer periods.<sup>2</sup> It gives rise to specialized cells that make up the tissues and organs of the body.<sup>3</sup> There are three major types of stem cells; they are embryonic stem cells, embryonic germ cells, and adult stem cells.<sup>4</sup> Among them, the cells are taken either from embryonic stem cells or adult stem cells of the animal and attached to a scaffold made of protein meshwork, eventually growing into strands of muscle cells.<sup>5</sup> In fact, the embryonic stem cell contains the benefit of virtually unlimited proliferation and because of this unlimited proliferation capacity, it can be used to arrange an infinite supply of meat from a single line of cells for in vitro meat production.<sup>6</sup>

The research on lab-grown meat, also known as in vitro meat or cultured meat, began in 1971 by Russell Ross. He discovered a way to create meat that builds up in cell culture instead of inside animals. This is grown through cellular agriculture technology, which refers to an interdisciplinary division of science at the intersection of medicine and farming.<sup>7</sup> Russell experimented on pig aorta and found that it can be grown in several weeks through cell culture.<sup>8</sup> Similarly, culturing of stem cell from animals had been examined in 1990 where scientists have shown that it is possible to produce a small amount of tissue, which can be cooked and consumed.<sup>9</sup> Following the result, Touro Applied BioScience Research Consortium produced the first eatable in vitro

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<sup>2</sup> Maneesha Deckha and Yunwei Xie, "The Stem Cell Debate: Why Should It Matter to Animal Advocates." *Stan. J. Animal L. & Pol'y* 1 (2008): 69.

<sup>3</sup> *Ibid.*

<sup>4</sup> National Institute of Health (NIH), "Stem Cell: Scientific Progress and Future Research Directions", ES-2 (2001), U.S. Health and Services Department, <http://stemcells.nih.gov/info/scireport/2001report.htm>.

<sup>5</sup> Edelman PD, McFarland DC, Mironov VA, Matheny JG, et al., "Commentary: In Vitro-Cultured Meat Production", *Tissue Engineering* 659, 2005 in Trae Norton, "From the Lab to the Supermarket: In Vitro Meat as a Viable Alternative to Traditional Meat Production." *J. Food L. & Pol'y* 11 (2015): 157.

<sup>6</sup> Zachary Schneider, "In vitro meat: Space travel, cannibalism, and federal regulation", *Hous. L. Rev.* 50 (2012): 991.

<sup>7</sup> Russell Ross, "The smooth muscle cell: II. Growth of smooth muscle in culture and formation of elastic fibres", *The Journal of cell biology* 50, no. 1 (1971): 172-186.

<sup>8</sup> *Ibid.*

<sup>9</sup> D.J. Siegelbaum. "In search of a test-tube hamburger", accessed 02 June 2018, <http://content.time.com/time/health/article/0,8599,1734630,00.html>.

muscle protein from goldfish in 2000.<sup>10</sup> Thereafter, National Aeronautics and Space Administration (NASA) successfully cultured turkey muscle cells in 2001. This was done as a potential means of food for astronauts on long space missions. The Tissue Culture and Art Project and Harvard Medical School in 2003 exhibited a few centimetres wide of stem cell grown from a frog.<sup>11</sup> Catts suggested that such meat may be grown without controversial growth hormone drugs. However, cells growing outside the body will not proliferate and mature without proper hormonal signals and growth factors.<sup>12</sup>

In 2009, scientists in the Netherland declared that they can manage to grow meat in the laboratory utilizing stem cell from a living pig. Thus, 30 laboratories around the world declared in 2012 that they are conducting research on cultured meat. As a result of further research, the first lab-grown burger was produced in 2013, where it was consumed at a news conference in London.<sup>13</sup> Professor Mark Post from Maastricht University had collected stem cell from a cow and grown it into strips of muscle. Ruetzler observed that it is close to meat, not that juicy but the consistency is perfect. He says “this is meat to me and it is really something to bite on and I think the look is quite similar.”<sup>14</sup>

Since the first public trial, there has been consistent attempt to produce commercially viable stem cell meat for sale in supermarkets for which several big corporations have invested huge sums of money. In

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<sup>10</sup> D.J. Siegelbaum. “In search of a test-tube hamburger”, accessed 02 June 2018, <http://content.time.com/time/health/article/0,8599,1734630,00.html>.

<sup>11</sup> Oron Catts and Ionat Zurr, “The Tissue Culture and Art Project: The Semi-Living as Agents of Irony,” in *Performance and Technology*, ed. Susan Broadhurst and Josephine Machon (London: Palgrave Macmillan, 2006), 153–68.

<sup>12</sup> Oron Catts and Ionat Zurr, “Ingestion / Disembodied Cuisine”, *Cabinet Magazine*, Issue 16, The Sea Winter 2004–2005, [http://www.cabinetmagazine.org/issues/16/catts\\_zurr.php](http://www.cabinetmagazine.org/issues/16/catts_zurr.php).

<sup>13</sup> Melissa Hogenbom. “What does a stem cell burger taste like?”, *Dhaka: Green Watch*, August 11 2013, <http://greenwatchbd.com/what-does-a-stem-cell-burger-taste-like/>.

<sup>14</sup> Melissa Hogenbom. “What does a stem cell burger taste like?”, *Dhaka: Green Watch*. August 11 2013, <http://greenwatchbd.com/what-does-a-stem-cell-burger-taste-like/>.

2016, the Memphis Meats Company launched a video showcasing its cultured beef meatball. In 2017, the first cultured poultry like chicken and duck-based foods were shown to the public.<sup>15</sup> SuperMeat, an Israeli company, ran a viral crowdfunding campaign in 2016 for its work on cultured chicken meat.<sup>16</sup> Mosa Meats also moving towards attracting consumer's attentions to such new type of diet.

From the above exposition, it is clear that the creation of stem cell meat is a definite possibility. It could be the next generation's meat creation. Before proceeding with the discussion on the legality of consuming this type of meat, there is a need to understand the intricacies involved in manufacturing lab-grown meat.

## MANUFACTURING PROCESS OF LAB-GROWN MEAT

As the researcher has mentioned, lab-grown meat is also recognised through other more familiar terms such as *in vitro* meat, cellular agricultural meat, artificial meat, synthetic meat and cultured meat. All these names refer to meat which is not harvested from the slaughter of livestock. Rather, the meat is muscle tissue from the stem cells of an animal in the laboratory cultivated through a scientific process. Tissue engineering is a broad field of science that has been taken in many directions and consumability is one of these directions. In order to produce *in vitro* meat, scientists usually follow certain steps.

First, scientists take a small number of cells from a living animal or from a freshly slaughtered animal. It is clear that the harvesting of cells is an important element of the process, irrespective of whether the animal is dead or alive. This is the main concern when the discussion on the *Shari'ah* part is made in the proceeding part of the article. However, at the present time, there is a need to understand the types of methods in the

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<sup>15</sup> Madeline Farber, "A San Francisco Startup Is Serving Chicken That Was Made in a Lab", *Fortune*, March 15, 2017, <http://fortune.com/2017/03/15/memphis-meats-lab-grown-chicken-peta/>;

Amanda Kooser, "This lab-grown chicken and duck meat looks surprisingly delicious", CNET, 16 March 2017, <https://www.cnet.com/news/chicken-duck-meat-memphis-meats-lab-clean/>.

<sup>16</sup> Lulu Chang, "Super Meat wants you to try its lab-grown chicken breast", Digital Trends, 2016, <https://www.digitaltrends.com>, (accessed 02 June 2018).

harvesting of these cells. Scientists apply either one of two methods of collecting cells, i.e. through the extraction of a slice of existing muscle tissue from an animal, which can thereafter live and flourish in a growth medium. They can also extract the cells by taking embryonic and adult stem cells and stimulating them into muscle tissue.<sup>17</sup> At the first stage cells are replicated in the lab setting and it takes around three months to grow and turn into the desired form of meat. According to scientists, this is a faster and more disinfected growth condition in comparison with natural animal growth phases.<sup>18</sup>

Second, scientists culture or cultivate cells in a growth medium where they encourage the cells to proliferate into a separate large amount of muscle tissues.<sup>19</sup> Generally, production of in vitro meat encompasses the growth of animal muscular tissue in the laboratory. According to Mark Post, the most advanced method adopted by scientists is the collection of muscle-specific stem cells from a real cow and persuading those cells to constitute fibres of muscular tissue. Thereafter, all these fibres assemble to make a hamburger patty.<sup>20</sup> In addition, cultured meat also requires taking collagen matrix (a type of protein found in the joint where two bones are connected) from adult stem cells taken from a living animal. Thereafter, cells and collagen together flourish into strips of skeletal muscle. In addition, fat cells also need to be co-cultured in order to reproduce the flavour of ordinary meat and to enhance its texture and tenderness. Growing cultured meat also entails a cardiovascular system to deliver oxygen, nutrients and to remove metabolic waste.<sup>21</sup> However, in the cultivation of these meats, scientists take into consideration the

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<sup>17</sup> Z.F. Bhat and Hina Bhat, "Animal-Free Meat Bio fabricate", *American Journal of Food Technology* 6, no.6, (2011): 441-459 .

<sup>18</sup> Carolyn Mattick, Brad Allenby, "The Future of Meat", *Issues In Science & Technology*, vol.30, no. 1, (2013), <http://issues.org/30-1/carolyn/>.

<sup>19</sup> Neil Stephens, "In Vitro Meat: Zombies on the Menu?", *SCRIPTed* 7, no.5, (2010): 394, 395.

<sup>20</sup> Markham Heid, "You Asked: Should I Be Nervous About Lab-Grown Meat?" *Time*, September 14, 2016, <http://time.com/4490128/artificial-meat-protein/>.

<sup>21</sup> Ginger Hultin, "Lab-Grown Meat: Exploring Potential Benefits and Challenges of Cellular Agriculture", *Food and Nutrition*, 2017, <https://foodandnutrition.org/march-april-2017/lab-grown-meat-exploring-potential-benefits-challenges-cellular-agriculture/>.

reduction in the consumption of natural resources, the emission of greenhouse gasses and fewer use of surface land.<sup>22</sup>

In addition to the above, Benjaminson and Eelen suggested two semi-identical approaches in the in vitro meat production process i.e., the self-organizing and scaffold-based system. The scaffold-based production refers to growing cells around a specific support structure. In order to produce in vitro successfully, certain requirements have to be fulfilled. First, a cell must be able to reproduce itself infinitely and form into functioning skeletal muscle tissue. Second, the cell is attached to a three-dimensional scaffold which influences muscle development. Third, a supply of nutrients and removal of waste must be ensured in the growth medium.<sup>23</sup> Finally, bioreactors are needed to mature and condition the muscle cells into “functional muscle fibers”.<sup>24</sup> As far as the scaffold system is concerned, scientists have proposed another two approaches. One is the Minov approach where he utilized collagen spheres, upon which a cell could grow, flourish and finally differentiate into the skeletal muscle cell. Another one is the Van Eelen’s approach which utilizes a collagen meshwork, through which the culture medium can penetrate and be replaced as needed.<sup>25</sup>

In regard to the self-organizing system of creating in vitro meat, it produces a more structured meat product such as steak. This system utilizes explanted animal muscle tissue and it is found that co-cultures of cells derived from similar adult muscle tissue then it can adhere, attach and grow upon a muscle tissue explants substrate (a substance which an

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<sup>22</sup> Patrick D. Hopkins and Austin Dacey, “Vegetarian meat: Could technology save animals and satisfy meat eaters?” *Journal of Agricultural and Environmental Ethics* 21, no. 6 (2008): 585.

<sup>23</sup> Edelman PD, McFarland DC, Mironov VA, Matheny JG, et al., “Commentary: In Vitro-Cultured Meat Production”, *Tissue Engineering* 659, (2005) in Trae Norton, “From the Lab to the Supermarket: In Vitro Meat as a Viable Alternative to Traditional Meat Production.” *J. Food L. & Pol’y* 11 (2015): 157, 180.

<sup>24</sup> Marloes LP. Langelaan, Kristel JM Boonen, Roderick B. Polak, Frank PT Baaijens, Mark J. Post, and Daisy WJ van der Schaft. “Meet the new meat: tissue engineered skeletal muscle.” *Trends in food science & technology*, 21, no. 2 (2010): 59-66.

<sup>25</sup> Z.F. Bhat and Hina Bhat, 441, 441-42.



organism grows and lives on and is supported by).<sup>26</sup> Some other additional production processes for in vitro meat may also exist in the future, for example, organ-printing techniques, biophotonics, and nanotechnologies.<sup>27</sup>

Having understood the process involved in the creation of stem cell meat, the discussion now turns to the position of food and its relation to the principle of *Maqasid al-Shari'ah*, which is dealt with in the next part of this article.

### FOOD AND MAQASID AL-SHARI'AH: AN OVERVIEW

The principal objective of the *Shari'ah* is to ensure that the welfare of humans is promoted and protected in order to ensure that humans are able to live well in this world and prepare for the Hereafter. It further seeks to guarantee the protection of the five essential values in a human's life from all sorts of exploitations and evils. Achieving the objective of *Shari'ah* is the prime obligation of every Muslim through their acceptance of anything that is deemed *halal* and the rejection of any matter that has been declared as *haram*. As the Holy Quran states that:

“Then We have put you (Muhammad PBUH) on a plain way (*Shari'ah*) of our commandment. So follow you that (Islamic Monotheism and its laws), and do not follow the desire of those who know not”.<sup>28</sup>

Muslims believe that through obedience and upholding of the Quranic directions,<sup>29</sup> results in the protection of the physical and mental health in this world and will be rewarded in the Hereafter. Under Islamic jurisprudence, the *Maqasid al-Shari'ah* is divided into three categories or objectives, which include, the essential things in life (*daruriyyah*), the complementary things in life (*hajiyyah*) and embellishments in life (*tahsiniyyah*). The *daruriyyah*, is further divided into the preservation and protection of five fundamental values such as *al-Din* (religion), *al-*

<sup>26</sup> Morris A. Benjaminson, James A. Gilchrist, and M. Lorenz. “In vitro edible muscle protein production system (MPPS): Stage 1, fish.” *Acta astronautica* 51, no. 12 (2002): 880.

<sup>27</sup> Ibid.

<sup>28</sup> Al-Qur'an, *Al-Zukhruf*:18.

<sup>29</sup> Al-Qur'an, *Al-Ana'm*:38.

*nafs* (life, body, soul, and mind) *al-'ird* (progeny or lineage), *al-'aql* (intellect) and *al-mal* (property).<sup>30</sup>

Food production, marketing, and consumption is directly and indirectly, related to the first three values. Therefore, in this regard, Muslims are required to preserve their “*Din*” by fulfilling the Shari’ah principle by ensuring that during production, marketing, and consumption of food, these processes are done in line with the requirements mentioned in the Qur’an and hadith of the holy Prophet (s.a.w). In other words, a Muslim must not adopt any means and methods with regard to diet contrary to the guideline of Shari’ah. Identically, the protection of life is correspondingly imperative and obligatory for every Muslim in the society. Protection of life refers to safety of life from unlawful homicide and killing of the children from fear of sustenance. This is the highest level of safeguard toward a human life because Almighty Allah made the life sacred. As it is revealed in the Quran that:

“Nor take life - which Allah has made sacred - except for just cause. And if anyone is slain wrongfully, we have given his heir authority (to demand *qisas* or to forgive): but let him nor exceed bounds in the matter of taking life; for he is helped (by the Law)”.<sup>31</sup>

Nevertheless, the protection of life further involves another feature i.e. preservation of life from any sort of injury to body and health irrespective of whether it is a direct or indirect harm for example by reason of taking a specific diet or any other causes. Moreover, life comprises of physical, mental and spiritual components that are developed, maintained and nourished by continuous feasting of food. Therefore, many questions arise in the eye of Shari’ah as to whether the creation of stem cell meat is a violation of natural law (*fitrah*) or the *sunnatullah*? The next question to be asked would then be, whether lab-grown meat can be considered as having life in it? Further, should it be “slaughtered” and blood be drained from this meat? If it is not considered as a “living” being, then should it be considered as a dead cell that developed through specific chemical and scientific process, and hence should be equated to “dead” meat?

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<sup>30</sup> Mohammad Akram Laldin, *Introduction to Shari’ah and Islamic Jurisprudence*, (Kuala Lumpur: CERT publication, 2006), 14-27.

<sup>31</sup> Al-Qur’an, *Al-Isra*:33.

In answering the issue of the violation of natural law (*fitrah*) or the *sunnatullah*, it is submitted that production of meat in the laboratory is tantamount to evading the primordial nature (*fitrah*) endowed by the Allah (S.w.t) toward the animal. An analogy of primordial nature (*fitrah*) of a human being can be considered here. Human *fitrah* is a character of nature that is inclined to observe the true religion of nature i.e. Islam. The *fitrah* of an animal, on the other hand, is to supply benefits like meat, milk among other benefits for human survival in a natural manner. Thus, anything that goes beyond the natural process will be termed as alteration of Allah's creation. As Mawdudi observed that, "alteration of Allah's creation is an act of devils which refers to do any act against the human nature and nature of the thing and adopt any means and methods disregarding original objective of nature".<sup>32</sup>

The Holy Quran stated in this regard that Satan has vowed:

"I will mislead them, and I will create in them false desires; I will order them to slit the ears of cattle, and to deface the (fair) nature created by Allah.' Whoever, forsaking Allah, takes Satan for a friend, hath of a surety suffered a loss that is manifest".<sup>33</sup>

Hence, adopting any means and methods of producing meat without natural farming will arguably frustrate the goal of the Shari'ah. Preservation of *nafs* often relates to the third objective of protection of lineage and pure food is the best means to produce a stronger generation. In the next section the researcher elaborates on the perception of pure food in Shari'ah.

## THE NOTION OF PURE FOOD IN THE SHARI'AH

In the Holy Qur'an and Sunnah, there are two words that have been used together to define pure food, one is *halal* and other one is *tayyibah*. The literal meaning of *halal* is lawful, permissible or allowable things under the Shari'ah. The word *halal* under Islamic jurisprudence also contains the meaning of choice to do an act or omission permitted by the Shari'ah

<sup>32</sup> Sayyed Abul A'la Mawdudi, *Tafhim al-Quran*, (Dhaka: Adhunik Prokashoni, 2004), 184.

<sup>33</sup> Al-Qur'an, *Al-Nisa*:119.

which is synonymous to the word *mubah*.<sup>34</sup> The word *halal* is predominantly used in relation to food and food products, food ingredients, cosmetics and personal care products which have been produced or manufactured in accordance with Islamic teachings and the principles of Shari'ah law.

By definition, “*Halal* foods are those which are free from any component that Muslims are prohibited from consuming.”<sup>35</sup> On the other hand, the word *tayyib* or *tayyibah* usually refers to pure, good quality and delicious creatures.<sup>36</sup> It also refers to pleasant, delightful, delicious, sweet, pure and clean.<sup>37</sup> The opposite of *al-tayyibah* is *al-khabithah* which signifies impurity, bad quality, contaminated, polluted, defective, spoiled, rotten, and harmful of all above aspect including foods.<sup>38</sup> The holy Quran clarified and distinguished the term *tayyibah* and *khabithah* stating that:

“Say: “Not equal are things that are bad (all that is evil and bad as regards things, deeds, beliefs, persons and foods) and things that are good (all that is good as regards things, deeds, beliefs, persons and foods), even though the abundance of the bad may dazzle thee; so fear Allah, O ye that understand; that (so) ye may prosper”.”<sup>39</sup>

The verse of the Quran magnificently expressed that pure things including food are those free from harmful elements and contain all ingredients necessary for our health and which is often known as *halal*

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<sup>34</sup> Qutub Mustafa Sanu, *Mu'jam mustalahat Usul al-Fiqh*, (Beirut: Dar al-Fikr al-Mucasir, 2000), 325.

<sup>35</sup> Mian N. Riaz, and Muhammad M. Chaudry, *Halal Food Production*, (London: CRC Press 2004), 1-8.

<sup>36</sup> Abd ar Rahman ibn Ahmad Ibn Rajab, *Jami' al-Ulum wa al-Hikam fi Syarh Khamsina Hadithan min Jawami' al-Kalam*, (Qaherah: Dar al-Hadith, 1980) cited in: Anas Bin Mohd Yunus et al, “The Concept of Halalan Tayyiba and Its Application in Products Marketing : A Case Study at Sabasun HyperRuncit Kuala Terengganu, Malaysia”, *International Journal of Business and Social Science* 1, No. 3 (December 2010), 242.

<sup>37</sup> Al-Ghazali. *Ihya' 'Ulum al-Din*, vol 6, (Beirut: Dar al-Kitab al-'Arabi, n.d.), 655, 820; Izutsu, T. *Ethico-Religious Concepts in the Qur'an*, (Montreal: Mc Gill University 1966). 235.

<sup>38</sup> Kamus Idris al-Marbawi, *Kamus al-Marbawi*, (Kuala Lumpur: Darul Nukman, 1990).

<sup>39</sup> Al-Qur'an, *Al-Maidah*:100.

food. Now, *halalan tayyiban* means any consumption of products, to preserve life, safeguard the future generations and integrity. In other words, *halal* food are expected to be safe to consume under the Shari'ah.<sup>40</sup> The Islamic approach to health care encompasses nourishing the body not only by the demonstration of faith, but by consuming lawful food as an *amanah* from the Law-giver. Therefore, believers must select healthy food and avoiding unwholesome ones to achieve the pleasure of Allah.<sup>41</sup> Numerous verses in the holy Quran emphasizes on this very crucial issue. Al-Qur'an guides us to eat pure food stating that:

“Eat of the good things which We have provided for you”.<sup>42</sup>

“Eat of what is lawful and wholesome on the earth”.<sup>43</sup>

“So eat of the lawful (Halal) and good food (Pure wholesome, halal cattle slaughtered according to Islamic method) which Allah has provided for you. And be grateful for the Graces of Allah, if it is He Whom you worship”.<sup>44</sup>

The same issue has been addressed in numerous places in the Qur'an. These include *Surah al-Maidah* chapter 5: verses 1, 3, 4, 5, 87, 88, and 90; *Surah al-An'am* chapter 6: 118, 119, 121, 138, 142, and 145; *Surah al-Nahal*, chapter 16: 114- 117; and in *Surah al-Hajj*, chapter 22: 34 and 36. These verses described the criterion for *halal* and *haram* ways of producing meat. It is further shown that Islam immensely emphasises the need for ensuring a pure diet.

## **THE RATIONALE FOR THE PROHIBITION OF *HARAM* FOOD (MEAT)**

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<sup>40</sup> Emi Normalina Omar, Harlina Suzana Jaafar, Muhamad Rahimi Osman, and Faisol Nasruddin, “Halalan Toyyiban supply chain the new insights in sustainable supply chain management”, 2013, 137, <https://core.ac.uk/download/pdf/19589400.pdf>.

<sup>41</sup> Aisha Stacey, Health in Islam (part 3 of 4): Diet and Nutrition, IslamReligion.com, accessed 2 June 2018, <https://www.islamreligion.com>.

<sup>42</sup> Al-Qur'an, *Al-Baqarah*:172.

<sup>43</sup> Al-Qur'an, *Al-Baqarah* :168.

<sup>44</sup> Al-Qur'an, *Al-Nahl*:114.

*Haram* is the opposite of *Halal* and it refers to the total prohibition of an act or consumption of items proscribed by the Shari'ah. Islamic jurisprudence defines *Haram* as "something that must be avoided according to the Islamic law".<sup>45</sup> In general, the Quranic guideline is that all foods are *halal* except those specifically mentioned as *haram*. According to the directions in the Quran and Sunnah, the following categories of foods and meats are *haram* and any ingredient or product derived from these sources or contaminated with them are also to be considered as *haram* for Muslims. The list of haram foods and meats includes meat of carrion or dead animals which were strangled, beaten, fallen from a height, gored by horn or animals partly devoured by wild beasts.<sup>46</sup> Others are animals killed in a manner which prevents their blood from being fully drained from their bodies, animals that was not blessed with the name of Allah at the time of slaughter, meat of swine (pig),<sup>47</sup> carnivorous animals with fangs, e.g. lions, dogs, wolves, tigers etc., Also prohibited are birds of prey like falcons, eagles, owls, vultures, reptiles, frogs, snakes, crocodiles, mules asses, pests e.g. rats and scorpions and insects excluding locusts.<sup>48</sup>

Determining lawful and unlawful is the paramount exclusive right of Allah (s.w. t.) and no human being can take this right into his own hand. The power of declaring *halal* and *haram* is the authority of Almighty Allah (s.w.t.). The fundamental basis of prohibition in the above-mentioned food categories including various types of meats are purely and strictly on the basis of Quranic guidance. However, some Muslim jurists and scientists have attempted to explicate or justify some of these prohibitions based on other Shari'ah directions and scientific understanding.

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<sup>45</sup> Yusuf ibn Abdallah ibn Mohammed ibn Abd al-Barr, *Jâmi` Bayân al-`Ilmi wa-Fadlihi wamâ Yanbaghî fî Riwayatihi wa Hamlih*, (Beirut: Dar al-Kutub al-`Ilmiyyah 2000) cited in The Concept of Halalan Tayyiba and Its Application in Products Marketing : A Case Study at Sabasun HyperRuncit Kuala Terengganu, Malaysia by Anas Bin Mohd Yunus at.el. *International Journal of Business and Social Science* 1 No. 3, (December 2010), p.240.

<sup>46</sup> Al-Qur'an, *al-Maidah*:3.

<sup>47</sup> See Al-Qur'an, *al-Maidah*:3, see also Al-Qur'an *al-An'am* :145

<sup>48</sup> Mian N. Riaz, and Muhammad M. Chaudry, *Halal Food Production*, (London: CRC Press, 2004),1-8.

The first reason is based on the existence of life in the animal cell. If the cell dies after being taken from the body of an animal, then it is haram because anything derived from this source becomes prohibited in the same way. If meat can be produced in the lab contrary to the natural process, it is tantamount to transgressing clear indications in the Qur'an and hadith. Second, the reason for the prohibition of certain types of meat is due to its impurity and harmfulness. Therefore, a Muslim is not obliged to know why and how a certain food is prohibited. By making it *haram*, there must have been some harm for human beings. Nevertheless, this is actually supported by scientific finding whereby medical doctors opined that, the *haram* items are largely found to be harmful to human beings.<sup>49</sup>

The third reason is to conserve the nobility of the human body by preventing it from degradation through the consumption of *haram* food.<sup>50</sup> Fourth, carrion and dead animals are unhealthy for human consumption. The reason behind it is that the decaying process leads to the formation of chemicals, which are harmful to the human body.<sup>51</sup> The fifth reason is that consumption of blood is prohibited and draining of blood from an animal is obligatory, because, the harmful bacteria, the product of metabolism and toxins flow out through blood and leaves the body of animal free from those harmful elements. Therefore, if blood has not been drained properly and adequately these dangerous substances remain within the meat, which certainly causes harm to the human body.<sup>52</sup>

Sixth, the flesh of swine serves as a vector for pathogenic worms to enter the human body. It is pertinent to mention here that pathogens are microscopic organisms that cause or have potential to cause various illnesses ranging from minor to life threatening ailments. All microbes are not pathogenic; however, the harmful pathogens are bacteria, viruses,

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<sup>49</sup>Nurdeng Deuraseh, "Lawful and unlawful foods in Islamic law focus on Islamic medical and ethical aspects." *International Food Research Journal* 16 (2009): 469-478.

<sup>50</sup>Burhanudeen 'Ali al-Marghinani, *Al-Hidayah: Sharh Bidayah al-Mubtada*, vol. 4 (Istanbul: EDA Nesriyat Hifzullah Kahraman, 1991), 68.

<sup>51</sup>Javaid Aziz Awan "Islamic food laws-I: Philosophy of the prohibition of unlawful foods." *Science and Technology in the Islamic World* 6, no. 3 (1988): 151-165.

<sup>52</sup>Mian N. Riaz, Muhammad M. Chaudry, *Halal Food Production*, (London: CRC Press, 2004), 12.

protists, fungi, parasitic worms and prions.<sup>53</sup> These are available in the flesh of swine therefore Allah (s.w.t.) made it *haram*. In addition, the fatty acid structure of pork fat has been mentioned as being incompatible with the human fat and biochemical system.<sup>54</sup> Finally, intoxicants are considered as harmful to the nervous system as it affects the senses and human Judgment. In many cases they lead to social and family problems even loss of life.<sup>55</sup>

### **GUIDELINES FOR HALAL MEAT PRODUCTION UNDER THE SHARI'AH**

In order to better understand Islamic ruling for the production and consumption of stem cell meat, it is necessary to consider the Shari'ah guidelines. The Shari'ah has adopted a comprehensive guideline for ensuring *halal* meat that comes from *halal* animals. A Muslim should obey those parameters during the slaughtering of animal. Subject to the prohibition as mentioned above, all animals are fit for producing meat through slaughtering unless otherwise mentioned. *Halal* slaughter is one of the most humane methods available to the meat industry and the only method acceptable for Muslim consumers. In this section, we will discuss about the stipulations concerning animal slaughtering (*dhabaha*) under Shari'ah direction.

Nevertheless, these conditions often relate to the kind of animal, the person slaughtering it and the instruments, the slaughtering process, invocations, storage and processing and so and so forth. First of all we would like to clarify the term *dhabaha*, which literally mean to kill by slitting the throat, to slaughter, butcher, to massacre, to murder, to slay, to sacrifice or to immolate.<sup>56</sup> The word *dhabaha* also include the meaning

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<sup>53</sup> Regina Bailey, "A Guide to Different Types of Pathogens", 2018, ThoughtCo., <https://www.thoughtco.com/types-of-pathogens-4135656/>, (accessed 02 June 2018).

<sup>54</sup> Javaid Aziz Awan "Islamic food laws-I: Philosophy of the prohibition of unlawful foods." *Science and Technology in the Islamic World*. 6, no. 3 (1988): 151-165.

<sup>55</sup> Yusuf Al-Qaradawi, *The lawful and prohibited in Islam*, (Beirut: the Holy Quran publishing house, 1984), 24, 40, 41.

<sup>56</sup> J Milton Cowan, Edt. *The Hans Wehr Dictionary of Modern Written Arabic*,. (New York, Spoken Language Services, Inc, 1976), 307.



of purification or rendering good or wholesome. The technical meaning of the term is, “it is a method of killing an animal for the sole purpose of its meat and human consumption”.<sup>57</sup>

As for the animal to be slaughtered, it should be on the list of *halal* animals and the person who will perform the slaughtering should be an adult Muslim, who is sane and has a sound mind. Therefore, those who are not subject to the application of Shari’ah by reason of minority, infancy, insanity, and intoxication cannot perform the *halal* slaughter. Similarly, animal slaughtered by an idolater, a nonbeliever, and an apostate will not be acceptable as *halal*. Besides this, the instrument used for the slaughtering must be extremely sharp. This is to quickly cut the skin and sever off the blood vessels to enable the blood flow immediately. As Prophet Muhammad (s.a.w.) said: “if you perform *dhabah*, perform it well.” The incision, on the other hand, should be in the neck at some point just below the glottis and the base of the neck. The trachea and esophagus must be cut in addition to the jugular veins and the carotid arteries while the head should not be severed completely.<sup>58</sup>

In addition, *tasmiyyah* or invocation of the name of Allah is also significant during *dhabah*. On the intentional rejection of invocation during *dhabah*, jurists expressed different opinion. According to Imam Malik, it would be *haram* whether rejection of invocation was intentional or unintentional, while Imam Abu Hanifa opined that it will be *haram* if the rejection occurred intentionally. In the opinion of Imam Shafi, rejection should not affect the status of *halal* of the meat as the person is competent for *ibadah*. However, an invocation is a must in any form whatsoever which also relates to the legitimate or illegitimate intention for slaughtering.<sup>59</sup> Thus, it is believed that pronouncing *tasmiyyah* influences feelings of tenderness and compassion and serves to prevent cruelty towards animals. It also boosts the notion that there is no other objective of slaughtering animal except for food.

In case of a non-Muslim producer of *halal* meat, they should maintain all the above mentioned guidelines in addition to maintaining

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<sup>57</sup> Riaz and Choudry, 1-8.

<sup>58</sup> Ibid.

<sup>59</sup> Ibid.

separate equipments which must not be used for *haram* animal in terms of slaughtering, slicing, distinct packaging and storage. In other words, different cold storage other than those used for pork or other non-*halal* meat must be used. Meat minced or processed for Muslims should not be minced in the same machines used to mince pork or other non-*halal* meat. These are the Shari'ah guideline for *halal* meat production in the *halal* industry.<sup>60</sup>

## SHARI'AH POSITION ON LAB-GROWN MEAT

The Qur'an provides a scientific outline regarding food and drinks which are safe and healthy for the human body. There is no doubt that the ability to create stem cell meat is indeed a great innovation of the 21<sup>st</sup> century, in an era of advanced science and technology. However, this kind of meat advances serious questions about its permissibility under the Shari'ah and in relation to its safety and nutritional value. The Shari'ah, in this regard, declares some fundamental principles that must be taken into consideration before accepting or rejecting any scientific innovation. In this part, the researcher explores several issues relating to lab-grown meat under the purview of the Shari'ah.

There are no specific restriction provided by the scientists regarding the types and categories of animals that can only provide stem cells for producing meat. It seems that all animals are able to be subjected to the collection of stem cells for further production of meat in a laboratory. On the other hand, Islamic Law has specific guidelines for meat produced from *halal* animals, which are acceptable for Muslims. Therefore, even if the production process of *in vitro* meat is acceptable under the Shari'ah that must come from animals recognised as *halal* under the Shari'ah.

Permitted animals in some situations may also become *haram* as the Quran says, "dead meat, that on which hath been invoked the name of other than Allah. "That which hath been killed by strangling, or by a violent blow, or by a headlong fall, or by being gored to death; that which hath been (partly) eaten by a wild animal; unless ye are able to slaughter

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<sup>60</sup> For an example of these guidelines, please see the Malaysian Protocol for the Halal Meat and Poultry Productions, Department of Islamic Development Malaysia, available at [www.hala.gov.my/v4/images/pdf/protocol%20%](http://www.hala.gov.my/v4/images/pdf/protocol%20%).

it (in due form); that which is sacrificed on stone (altars); (forbidden) also is the division (of meat) by raffling with arrows”.<sup>61</sup> Among the birds, the ones which pecks are permitted under the Shari’ah.

Meat from any of the above categories of animal is prohibited, therefore cells from such animals are also prohibited under the Shari’ah. The reason for the prohibition of these types of meat and stem cell is because they are derived from impure animals. As the Holy Quran commands that: “Eat of the good things which we have provided for you”.<sup>62</sup> “Eat of what is lawful and wholesome on the earth”.<sup>63</sup> In another verse, it is further mentioned that: “So eat of the lawful (*halal*) and good food (Pure wholesome, *halal* cattle slaughtered according to Islamic method) which Allah has provided for you. And be grateful for the Graces of Allah, if it is He Whom you worship”.<sup>64</sup> The Prophet (s.a.w.) said: “Allah the Almighty is good and accepts only that which is good. And verily Allah has commanded the believers to do that which He has commanded the Messengers”.<sup>65</sup> The same issue has been addressed in several verses of the Qur’an.<sup>66</sup> These verses described the criterion of acceptable or *halal* and *haram* food including modes of producing meat. It is further shown that, Islam immensely emphasises the importance of taking pure diet and as a pre-requisite for acceptance of spiritual activities.

In addition, the Almighty Allah declares these meats as *haram* for consumption. In other words, this indicates that there must be something detriment to human health and mind. It is not the duty of a Muslim to ask question why and how certain food become impure and harmful or why Allah has prohibited such food except for exploring the truth. Al Qur’an stated that: “Hence, do not utter falsehoods by letting your tongues determine (at your own discretion), “This is lawful and this is forbidden”, thus attributing your own lying inventions to God: for, behold, they who

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<sup>61</sup> Al-Qur’an, *Al-Maidah*:3.

<sup>62</sup> Al-Qur’an, *Al-Baqarah*:172.

<sup>63</sup> Al-Qur’an, *Al-Baqarah*:168.

<sup>64</sup> Al-Qur’an, *Al-Nahl* :114.

<sup>65</sup> Imam Nawawi, “Hadith 10”, accessed 19 December 2018, <http://40hadithnawawi.com/index.php/the-hadiths/hadith-10> .

<sup>66</sup> Al-Qur’an, *Al-Maidah*: 1, 3, 4, 5, 87, 88, and 90, *al-An’am* 6: 118,119,121,138, 142, 145, *al-Nahl*: 114,115,116,117 and *al-Hajj* 22: 34, 36.

attribute their own lying inventions to God will never attain to a happy state”.<sup>67</sup>

Furthermore, the reason is to conserve the nobility of human body by preventing it from being disgraced through consumption of *haram* food.<sup>68</sup> Beside, the jurists, medical professionals and researchers are of the opinion that, *haram* foods, are harmful to human beings.<sup>69</sup>

The second question is regarding the notion of dead meat (*maytatu*), which is prohibited under the Shari’ah. *Maytah* means an animal (meat) not slaughtered according to the teaching of Islam or meat of animal that died by itself or by an accident or dies before hunting. Al-Quran forbids this: “He has forbidden to you only carrion, and blood, and the flesh of swine, and that over which any name other than God’s has been invoked; but if one is driven by necessity- neither coveting it nor exceeding his immediate need, no sin shall be upon him: for, behold, God is much-forgiving, a Dispenser of Grace”.<sup>70</sup> In another verse it is said that, “He has forbidden to you only carrion, and blood, and the flesh of swine, and that over which any name other than God’s has been invoked; but if one is driven (to it) by necessity, neither coveting it nor exceeding his immediate need - verily, God is much-forgiving, a dispenser of grace.”<sup>71</sup>

The underlying reason behind the prohibition of *maytah* or carrion and dead animals is that it is unhealthy for human consumption. The reason behind is that the decaying process leads to the formation of chemicals, which are harmful to the human body.<sup>72</sup> Therefore, it could be argued that meat from stem cell cannot be determined as to whether it is considered as dead meat or not. As observed by Stephens, he stated that: “*With in vitro meat, there is no animal to slaughter, which means no*

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<sup>67</sup> Al-Qur’an, *An-Nahl*,:116-117.

<sup>68</sup> Burhanudeen ‘Ali al-Marghinani, *Al-Hidayah: Sharh Bidayah al-Mubtada*, vol 4 (Istanbul: EDA Nesriyat Hifzullah Kahraman, 1991), 68.

<sup>69</sup> Nurdeng Deuraseh, “Lawful and unlawful foods in Islamic law focus on Islamic medical and ethical aspects.” *International Food Research Journal* 16 (2009): 470.

<sup>70</sup> Al-Qur’an *Baqarah*:173.

<sup>71</sup> Al-Qur’an, *An-Nahl*:115

<sup>72</sup> Javaid Aziz Awan “Islamic food laws-I: Philosophy of the prohibition of unlawful foods.” *Science and Technology in the Islamic World* 6, no. 3 (1988): 151-152.

*inefficient natural resource consumption raising the animal to slaughter.*” One writer notes, *because there has never been a whole animal we cannot say the tissue is the ‘living-dead.’ This meat was never born, has never been ‘alive’ in any usual way we would apply to an animal, and has never been killed*”.<sup>73</sup> Therefore, this creates a situation which is known as *shubhah* whereby there is a grey area and the legality of the situation cannot be determined. In such a circumstance, it is better for Muslims to avoid it altogether. This is based on a hadith related by al-Bukhari and Muslim which mentions:

“On the authority Abi Abdillahi al-Nu’man ibn Basheer (ra) who said: I heard the Messenger of Allah (peace be upon him) say: “That which is lawful is clear and that which is unlawful is clear and between the two of them are doubtful [or ambiguous] matters about which not many people are knowledgeable. Thus, he who avoids these doubtful matters certainly clears himself in regard to his religion and his honor. But he who falls into the doubtful matters falls into that which is unlawful like the shepherd who pastures around a sanctuary, all but grazing therein. Verily every king has a sanctuary and Allah’s sanctuary is His prohibition. In the body there is a morsel of flesh which, if it be sound, all the body is sound and which, if it be diseased, all the body is diseased. This part of the body is the heart”.<sup>74</sup>

A third concern is related to the act of slaughtering the animal, which is an obligatory part of determining that the meat is *halal* meat. As stated by Stephen, there is no scope of slaughtering or blood drain in this meat process. As a result, this raises questions as to whether there is a blood flow, oxygen, carbon dioxide and protein in the muscle tissue. Islam prohibits the consumption of meat from animals, which has not been drained of blood through proper slaughtering methods because the blood of animal contains disease causing substances malignant pustule, brucellosis, pasteurellosis, and hemorrhagic septicaemia.<sup>75</sup>

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<sup>73</sup> Neil, 394, 395.

<sup>74</sup> Sahih al-Bukhari Book 2, Hadith No. 50, found in Sahih Al-Bukhari, sunnah.com, accessed 27 June 2019, <https://sunnah.com/bukhari/2/45>.

<sup>75</sup> Ebrahim Kazim, Medical Aspects of Forbidden Foods in Islam, *The Union-The Muslim Students Association of the United States and Canada* 8, no. 1 (1971): 4-6.

The Holy Quran emphasizes the importance of slaughtering in the appropriate manner as follows:

“And what reason have you that you should not eat of that on which Allah’s name has been mentioned, seeing that He has already made plain to you what He has forbidden to you-excepting what you are compelled to; But, behold, (it is precisely in such matters that) many people lead others astray by their own errant views, without (having any real) knowledge. Surely your Lord - He best knows those who exceed the limits”.<sup>76</sup>

On the other hand, Prophet s.a.w. shows the manner of slaughtering that he said:

“If you slaughter the animal with anything that causes its blood to flow out, and if Allah's Name is mentioned on slaughtering it, eat of it, unless the killing instrument is a tooth or nail. I will tell you why: As for the tooth, it is a bone; and as for the nail, it is the knife of Ethiopians.”<sup>77</sup>

Furthermore, the Messenger of Allah said:

“Verily Allah has prescribed proficiency in all things. Thus, if you kill, kill well; and if you slaughter, slaughter well. Let each one of you sharpen his blade and let him spare suffering to the animal he slaughters”.<sup>78</sup>

Based on this injunction, if blood has not been drained properly and adequately these dangerous substances remain within the meat, which can cause dangerous diseases to the human body.<sup>79</sup> Therefore, the Qur’an stated that:

“He hath forbidden you only carrion, and blood, and swine flesh, and that which hath been immolated to (the name of) any other than Allah. But he who is driven by necessity, neither craving nor transgressing, it is no sin for him. Lo! Allah is Forgiving, Merciful”.<sup>80</sup>

<sup>76</sup> Al-Qur’an, *Al-An’am*: 118,119,121.

<sup>77</sup> Imam Bukhari, *Shahih Bukhari*, No.451, accessed 11 December 2018, [https://www.sahih-bukhari.com/Pages/Bukhari\\_7\\_67.php](https://www.sahih-bukhari.com/Pages/Bukhari_7_67.php).

<sup>78</sup> Imam Muslim, *Shahih Muslim Hadith* No. 1955a, accessed 19 December 2018, <https://sunnah.com/muslim/34>.

<sup>79</sup> Mian N. Riaz, Muhammad M. Chaudry, *Halal Food Production*, (London: CRC Press, 2004), 12.

<sup>80</sup> Al-Qur’an, *Baqarah*:173.

The fourth issue is associated with *tasmiyyah* invocation during slaughtering. In the *in vitro* meat process, slaughtering is indeed possible before taking stem cells from the animal. If this is done, this could perhaps allow the use of the stem cells to be further cultivated. Nevertheless, in such a circumstance, there is the question of the criteria of the slaughterer. In this relation, the Qur'an commands that:

“And do not eat of that upon which the name of Allah has not been mentioned, for indeed, it is grave disobedience. And indeed do the devils inspire their allies [among men] to dispute with you. And if you were to obey them, indeed, you would be associate [of others with Him]”.<sup>81</sup>

Furthermore, intention and invocation of the name of Allah is an integral part of slaughtering. However, after commencement of the lab process, it is not possible to perform slaughtering or make invocation. Therefore, *tasmiyyah* is not possible here and such meat is more likely to be prohibited.

The final aspect is safety, and notion of *tayyibah* of the meat. It is unquestionably a true fact that the meats grown through natural means have proven safer in a good and pure form than lab-grown meat. To an ordinary mind, the nature, safety and quality of stem cell meat is doubtful and Muslim consumers are encouraged to abstain from its consumption. In other words, stem cell meat is unlikely to meet the standard of *tayyibah*.

## THE RIGHT OF CONSUMERS IN ISLAM

By virtue of the *Quranic* commandments and the guidelines of the Prophetic tradition, it is evident that access to pure food is an inherent and indispensable right for all human beings. We are all consumers and for Muslims, it is an obligation to follow the guidelines of *halal* and *haram* in respect of the production and preparation of food. Generally, food goes through three stages of preparation, which begins with food production to its consumption. It begins with the production of raw food, processing of the food, and finally the marketing and sale of the food. In order to secure consumer's rights, all personnel in these three processes

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<sup>81</sup> Al-Qur'an, *Al-An'am*: 121.

are responsible for its purity. On top of this, the government will also be held responsible for adopting appropriate and adequate laws and regulations for *halal*, and safety of foods.

As far as meat is concerned, carrion or dead meat from dead animal is offensive to human dignity, therefore, if anyone produced such meat he will be liable for violation of food production laws as well as a violation of consumer's rights. However, where stem cell meat originates from a dying or stunned animal as commonly practiced in Europe, such meat is not *halal* for Muslim consumers.<sup>82</sup> In doubtful situation such as this, Muslims are enjoined to ignore what is doubtful, as mentioned above. In other words *halal* and *haram* is clear in Islamic law but in between the two are doubtful matters such as stem cell meat. Since stem cells meat is controversial and ambiguous, it is advised that Muslim consumers should avoid it. If it is found unacceptable and proven harmful to the human body then it will also be prohibited for Muslim producers to produce such meat. If a non-Muslim producer wants to produce such meat for non-Muslim consumers he should obtain an approval from the proper authority of the concerned state. After getting approval, the seller has to maintain and comply with appropriate labelling rules stating that this is lab-grown meat and should be kept separately from other types of natural meat. Similarly if any other food is prepared from this meat there must be proper advertisement and disclosure to consumers.

## CONCLUSION

The study has highlighted the Shari'ah rules and regulations regarding *halal* meat production and consumption based on the Quran and Sunnah. Before accepting or rejecting any new invention such as stem cell meat, the effect and the consequences of such meat consumption to the society must be adequately measured. This is the very first stage of such scientific innovation which has not yet achieved that level where it can be implemented in a large-scale production for the human consumption.

The issue of producing and consuming stem cell meat might be a very sensitive issue in response to the growing consumer demand for

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<sup>82</sup>Muhammad Munir Chaudry, "Islamic food laws: philosophical basis and practical implications", *Food technology (USA)*.46, no.10, (1992): 92, 93, 104.



meat. Stem cell meat is similar to genetically modified foods (GMOs) which still raises some concern among consumers. Because scientific understanding about gene's function is still limited and therefore, any changes to the DNA of an organism might have an effect, which is impossible to predict or control.<sup>83</sup>

Furthermore, it is recommended that Muslim countries should provide a legal framework to regulate the safety and standard of stem cell meat products to protect consumers. Such regulations must consider specific provisions in their respective *halal* food and safety laws. Special emphasis may be required for stem cell meat and other scientifically produced food. In addition, more scientific research should be conducted when dealing with emerging technologies.

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<sup>83</sup>D. Lauterburg, *Food Law: Policy and Ethics*, (London: Cavendish publishing ltd., 2011), 161.