Trends in Food Science & Technology 47 (2016) 78–81

Contents lists available at ScienceDirect

Trends in Food Science & Technology

journal homepage: http://www.journals.elsevier.com/trends-in-food-science-and-technology

Commentary

Halal status of ingredients after physicochemical alteration (Istihalah)

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ARTICLE INFO

Article history:
Received 17 January 2015
Received in revised form
23 September 2015
Accepted 18 October 2015
Available online 20 October 2015

Keywords:
Halal
Haram
Istihalah
Transformation of state
Ethical foods

ABSTRACT

Background: Halal products are the only permissible products that can be consumed by Muslim population all over the world. Halal certification process is becoming critical due to processing advancements and conflict of opinions among various Islamic schools of thought. Multiple Halal certification standards are framed by regulatory bodies in different countries, but there is inconsistency about few issues among these standards. One such conflict is Istihalah, which deals with the alteration in physicochemical nature of food and render a non-permissible food (Haram) to an acceptable form (Halal) for Muslims. There is dire need to understand the grey areas, such as the concept of Istihalah, to develop unanimous International Halal Standards complying with the rulings of all Islamic schools of thought.

Scope and approach: To understand the Istihalah, scientific and Islamic literature from various schools of thought, has been reviewed. The primary objective of this study is to explain the concept of Istihalah with respect to the physicochemical alteration of food matrix and rulings of various Islamic schools, leading to generate a consensus for international Halal certification standards.

Key findings and conclusions: Istihalah is an agreed concept among Islamic schools of thought but the definition for the extent of such alteration (to be considered as Istihalah) is not agreed. This concept should not be used for Halal Certification as it may create ambiguous situation for the global acceptability and credibility of a certificate.

1. Introduction

Due to the recent developments in food compositions and complex nature of ingredients, the consumption of industrial origin food is becoming critical among consumers having various ethical believes i.e. including vegetarians, Jews and Muslims (Al-Mazeedi, Regenstein, & Riaz, 2013). Such ethical concerns of Muslim consumers are important factors for the increase in demand for production of Halal goods (Farouk, 2013; van der Spiegel et al., 2012), backed by its demand and willingness of consumer to pay more for Halal, as these are the only permissible products for Muslims, as per their religious obligations (Kamaruddin, Iberahim, & Shabudin, 2012). Global Halal market size is estimated from $ 580 billion (Ayyub, Rana, Bagi, & Al–Thomaly, 2013) to $ 660 billion (Al-Mazeedi et al., 2013). The term Halal refers to wide spectrum of issues in a Muslim life; while the most common use of it is in context of consumer goods e.g. food products and ingredients (including meat products, plant based products), food contact materials, cosmetics and pharmaceutical products (Aadam, Norhaznee, Noor, Harivaindaran, & Tajul, 2012).

Various Islamic schools of thought define Halal (permissible) and Haram (not permissible) food in a clear and similar manner. Still, there is confusion where chemical and physical properties of a matrix are altered. Such cases may be categorized as transformation of state or Istihalah. The term Istihalah is well reported in Islamic theology and refers to complete transformation of physical and chemical nature of a substance, resulting to another product having no physiochemical resemblance to the original material or any other Haram material (Jamaludin, Ramli, Hashim, & Rahman, 2012).

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http://dx.doi.org/10.1016/j.tifs.2015.10.011
0924-2244/

Halal certification bodies especially from Malaysia, Indonesia, Pakistan, Thailand, Brunei, Singapore and other countries are not only providing guidelines but also trying to come up with a single Halal certification protocol. But it is difficult to get consensus on a single Halal protocol document, until the concept of Istihalah is concluded or agreed upon.

This review is an effort to document various opinions about Istihalah, to make clear understanding for food processers who work with Halal certified products or intend for Halal certification of their products to enter in global Halal market. The present work will not only assist in a consistent global Halal production but also help to create a doubt free Halal market.

2. Transformation of food matrix during processing

Food structure is related to its chemical and physical properties (Aguilera, 2005), that change with processing. This change can be of high value where complete structure of food matrix gets changed, like in case of rendering of animal fat tissues. Furthermore, during processing, lipids undergo intense lipid hydrolysis and oxidation, leading to production of several compounds that change its physiochemical attributes, including texture, color and flavor (Gandemer, 2002).

Meat during cooking undergoes changes in texture, flavor, aroma and color. It is achieved by the breakdown, denaturation, and aggregation of proteins. This process changes secondary, tertiary, quaternary helix structure and surface hydrophobicity of myofibrillar proteins. Additionally, to a certain extent Maillard reactions may occur where carbohydrates react with amino acids giving a new complex while liberating water molecules. Apart from this, a huge number of byproducts (new structures) are formed and decomposition of protein (collagen tissue) also occurs. These facts are well reported long ago (Martens, Stabursvik, & Martens, 1982) while recent advances to understand cooking related changes are also documented in scientific literature (Christensen, Purslow, & Larsen, 2000; Tornberg, 2005).

Conversion of fermentable sugars to ethanol by yeast (e.g. *Saccharomyces cerevisiae*) and further conversion of ethanol to acetic acid by bacteria (genus *Acetobacter*) is a well known phenomenon (Adams, 1997; Mehaia & Cheryan, 1991).

The recent trend of bioactive packaging materials is also an example of transformation of food matrix, where functional substances are incorporated into the package wall and on optimal temperature/time conditions these compounds are released in food, just before consumption and so make alteration in the composition (Lopez-Rubio, Gavara, & Lagaron, 2006). Another example could be the acetic fermentation of alcohol, where ethanol is converted to acetic acid (Fig. 1) (Kocher, Kalra, & Phutela, 2006; Martin, 1934).

3. Concept of Istihalah

Among numerous challenges for Halal conformance and certification, the concept of Istihalah, cannot be ignored (Siaw & Rani, 2012). Islamic scholars from all schools of thought agree that Istihalah should be considered as Halal, in general however there are two groups in Islamic school of thoughts, concerning the status of a product that undergoes transformation process and should be covered under this term “Istihalah”. The one group of scholars including Maliki, al-Syawkani, Hanafi and Ibn Hazm al-Zahiri schools agrees that Istihalah concept can be used in multiple scenarios. In their view the concept of Istihalah is much flexible and includes natural and/or synthetic transformations (Taymiyyah, 2005). The synthetic transformation means that the change in matrix can be by human intervention and in such case the product will be considered as Halal. On the other hand, the second group (Hambali and Shafii) opinions bound the Istihalah concept to certain conditions only. These scholars accept natural transformations only, without any synthetic intervention. For example, transformation of a Haram product i.e. wine into vinegar (a Halal product) is only acceptable if such change happen naturally/continuously with no human intervention in any stage of process (al-Syarbini, 1994). In addition to aforementioned two groups, an important Islamic school of thought is Shia. They interpret Istihalah in a similar way (like first group, i.e. Maliki, al-Syawkani, Hanafi and Ibn Hazm al-Zahiri schools) and explain it further; If a Najis (un-pure; dirty with filth; i.e. also not allowed to consume) ingredient's product undergoes a change, so that the final product assumes the category of a Halal and Tayyib (pure, clean, allowed to consume), it becomes Halal and Tayyib; for example, if a Najis wood burns to ashes, or in another case where, a dog fell in a salt-marsh and transformed into salt, the consumption of salt from this salt-marsh is allowed as Halal and Tayyib.

Transformation of state (Istihalah) from Haram to Halal is accepted by all Islamic school of thoughts by giving similar examples from the sayings of Prophet Muhammad (P.B.U.H.). Among these are two most common reported; one is transformation of alcoholic beverage (Khamar) to vinegar (Al-Zayla'i & Ibn'Ali, 1895; Ibn Abidin, 1992); other is Swine/dog which drowns in a salt lake, gets decomposed and becomes salt itself, is now Halal (explained previously in this article) (As-Sistani, 2011), where the resulting products of both cases are considered as Halal and Tayyib.

But on the other hand a matrix does not become Halal and Tayyib if its final product after transformation does not fall in the category of Halal; like, if Najis wheat (un-pure; dirty with filth etc.) is ground into flour, and/or is used for baking bread, it does not become Halal and Tayyib as it is still a bread that can be traced back for its source of origin. Furthermore “A Haram and/or Najis product about which it is not clearly known whether it has undergone transformation of state (Istihalah) or not, still remains Haram” (As-Sistani, 2011).

Similarly the case of transformation of alcohol to vinegar can also be viewed from another angle. There is a reference, where Prophet Muhammad (P.B.U.H.) was asked for making vinegar from wine (alcoholic beverage) and he said No (Hadith no. 5140; Sahih Muslim) (Muslim-ibn-al-Ḥajjāj, 2008a); furthermore it is also reported that on various occasions the Prophet (P.B.U.H.) forbid to use orphans for making vinegar, while these have inherited wine or these were used to make wine (alcohol) (Muslim-ibn-al-Ḥ; ajjāj, 2008a). Now it is clear that although a vast majority agrees to categorize vinegar from alcohol as Halal and Tayyib, but a certificate provided for such vinegar can be doubtful for some groups. We can

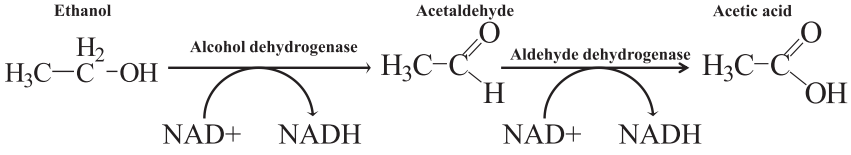

Fig. 1. Conversion of ethanol to acetic acid.