

Halal Food Issues from Islamic and Modern Science Perspectives

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Abstract. Adulteration of food products has become a common issue in many countries. Adulteration is the act of intentionally take the form of substitution of one species for another whereby the food products from one species have been mixed intentionally with either similar substitute ingredient or cheaper species. For instance, food manufacturers often choose lard as a substitute ingredient for oil because it is relatively cheap and easily available. However, the usage of lard and pork is a serious matter in Islam. It is because any foods containing ingredients from pig sources are prohibited (haram) for Muslims to consume. Due to this restriction, it is crucial to develop scientific methods to detect the presence of lard and pork in halal food products. A reliable technique for detection of pork and lard adulteration in halal food products is necessary in order to protect Muslim consumers from intentional or non- intentional food fraud. This paper will highlight on the issues of adulteration of pork and lard in food products. It also attempts to scrutinize an Islamic perspective on lard which derives from pork sources.

Keywords: Adulteration, Lard, Pork, Halal and Haram, Ingredients

1. Introduction

Food is one of the topics that have always been discussed among the scholars. This is because food is the basic necessity for the well-being of human. Recently, food production has been prepared based on the advancement of modern science and technology. There are several ingredient sources which have been used in the production of food products. These ingredients are either permissible (halal) or prohibited (haram). In addition, there is a mixing of ingredients such as chemical additives and synthetic ingredients. There is also a discussion among the scholars associated with the acquisition of source material, processing, packaging, shipping and so on. In other words, the food chain discussion starts from farm management to consumers, (from farm to fork). As more foods are available in the market, the authenticity of halal food has raised concern among Muslim consumers throughout the world. This is because adulteration of haram or shubhah ingredient in food products has been widespread and difficult to identify with the naked eye. Muslims are encouraged to investigate through scientific knowledge for the advantages and disadvantages, as well as the wisdom of such prohibition. This paper will focus on such issues based on Islamic and modern science approaches.

2. Halal and haram from Islamic perspective

In Islamic law, Muslims stress on the importance of the permissibility of sources of food to be consumed. This is because food intake will boost the development of human wellness and behaviour. Haram food is explicitly prohibited in the Qur'an, Sunnah and the consensus of the Muslim jurist (*Ijma'*). Muslim were prohibited from eating the flesh of pork and its derivatives as it is a sin and impiety to do so. These rulings

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have been stated from Islamic law as guidelines to all of mankind. Besides, eating of haram materials and using it as an adulterant or additives in food products are also forbidden. This is clearly demonstrated in many verses of the Quran. In Surah al-Maidah, for example Allah says:

“Forbidden unto you (for good) are carrion and blood and flesh of the swine, and that over which is invoked the name of other than Allah, and the strangled, and the dead through beating, and the dead through falling from a height, and that which has been killed by (the goring of) horns, and the devoured of wild beasts, unless you have cleansed (by slaughtering) it in the proper, lawful way, while yet there is life in it, and that which has been immolated unto idols. And (forbidden is it) that ye swear by the divine arrows. This is an abomination.”

(Al-Ma'idah, 5: 3)

There are also doubtful things and questionable in Islamic law. This *mashbooh* sources is doubtful and questionable in Islamic law. For instance, food that has been added by animal enzyme or substance from doubtful based ingredients into halal food products. This is mentioned in the sunnah of the Prophet Muhammad (s.a.w.) where it is stated that:

“Both doubtful things are evident but in between there are doubtful (mashbooh) things and most of the people having no knowledge about them. So whoever saves himself from these doubtful things, he saves his religion and his honor, but he who falls into doubtful matters fall into that which is unlawful, like the shepherd who pastures around a sanctuary, all but grazing therein. Truly every kind has a sanctuary, and truly Allah (s.w.t.) sanctuary is His prohibitions.”

(al-Bukhari, 1979)

Pigs are animals that are prohibited in Islam. This is clearly mentioned in the Quran, Sunnah and the consensus of the Muslim jurist (*Ijma'*). The prohibition of this animal is based on several aspects of harm from either chemical, microbial or psychology. (Hawwa, 1994; Sakr, 1991). Among the verses in the Quran that emphasizes prohibition of pigs can be found in surah al-Baqarah where Allah said:

“He hath only forbidden you dead meat and blood, and the flesh of swine, and that on which any other name hath been invoked besides that of Allah (s.w.t.) but if one is forced by necessity, without willful disobedience, nor transgressing due limits, -then is He guiltless. For Allah is Oft-forgiving Most Merciful.”

(Al-Baqarah, 2 : 173)

In commenting on the verse of the word 'flesh of swine' or pork meat al-Zamakhshari states in interpretation that, it also includes lard (al-Zamakhshari, 1998). Although the Quran mentions only the flesh but the pig derivatives and by-products are also prohibited as well. This view is supported by al-Qurtubi in *al-Jami' li Ahkam al-Qur'an* which includes lard as a part of the meat (Qurtubi, 2006). In addition, Ibn Hazm al-Zahiri that furs and bones which are derived from pig are also haram to be consumed. However, the skins derived from pigs are permitted when they are tanned. Ibn Hayyan and Dawood however suggest that the prohibition was only meant for meat not the lard and derivatives (al-Andalusi, n.d.).

There are many reasons for the prohibition of pigs and one of the reasons is to protect Muslims from harm. It is submitted; however that only Allah (s.w.t.) knows the exact reason and the real wisdom as to why pork is prohibited. From that perspective, Muslim scholars have a consensus opinion (*Ijma'*) on prohibition for all part of pig.

3. Issues on Halal food adulterations

Adulteration is a legal term for a food product which fails to meet certain standards. Adulteration usually refers to non-compliance to health or safety standards according to the Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA). Adulterants may be intentionally added to more expensive substances to increase visible quantities, reduce manufacturing costs and other deceptive or malicious purpose. Adulterants may also be accidentally or unknowingly introduced into the substances. Food adulteration is the act of intentionally debasing the quality of food offered for sale either by admixture or substitution of inferior substances or by the removal of some valuable ingredient.

Fats and oils are essential nutrient for human being. Industrially, manufactures have played an important role in the development of different areas of chemical products, pharmaceutical, cosmetic, and most importantly in food. In the first 50 years of the twentieth century, the use of animal fats in food was very common. For instance, lard (pig fat) was the most used products for domestic frying as well as raw material in mass production of breads and cakes. For food industry, lard still serves as an important ingredient in the formulation of some food products, mainly embedded products. However, many studies on nutrition have shown the side effects of some types of fat, like saturated fat found primarily in animal products.

As more food available in the market, the authenticity of halal food has raised much concern among Muslim consumers throughout the world. Muslim requires some protection to ensure that information on food labels and elsewhere presented to them is accurate (Eliasi, 2002). Usually, the ingredient label does not list the origin of the ingredients. Hidden ingredients from various sources present another serious problem for Muslim consumers (Riaz and Chaudry, 2003). The high demand for transparency in the food industry has enhanced the development of methods for the analysis of food ingredients.

Recently, halal authenticity is an issue of major concern in the food industry. Many cases were reported worldwide involving adulteration of haram or mushbooh ingredients in foods productions. In addition, with the advent of modern science and technology, food had undergone many processes and was transported to different parts of the world which has raised concern among Muslim consumers and led to their curiosity, as to whether the processed foods contain any haram substances. In the last few years, revelations related to pork and lard being mixed in food and food products have surfaced. There is an increasing trend in some countries to mix pork and lard in their food products for the purposes of gaining extra economic profit. The method lard detection in food products was investigated, namely cakes formulation (Syahariza *et al.*, 2005), chocolate formulation (Che Man *et al* 2005), and biscuits formulation (Syahariza *et al.*, 2006).

Moreover, the fraudulent misdescription of food contents can either be intentional or unintentional contamination. Most issues arising in food productions include porcine-based products in food and beverages, usage of gelatin from animals source which is not halal, consumption of non halal food additives, contamination of food and beverages with alcohol, meat that is not slaughtered according to the ritual Islamic manner and last but not least the use of GM (genetic modified) foods. Hence, harmonization of modern science and Islamic law is very important especially with regard to halal authentication to protect from fraud and deception. In food industry, pork and its derivatives are among the most widely used materials, such as gelatin, sodium stearoyl lactylate, shortening, collagen, whey, calcium stearate, capric acid, myristic acid, oleic acid, pancreatic extract, bone ash and lard. In this context, Muslim researchers tend to stick with the majority view of Muslim jurists who forbid any sources of pig either flesh or lard and its derivatives.

4. Modern Science Technique for Detection of Pork and Lard Adulterations in Halal Food

There are various approaches to detect and quantify the level of adulterants in food products. The first approach is by determining the ratios between some chemical constituents and assuming that these ratios are constant in particular food products. This approach seems to make sense that any addition in any food products will modify or change these ratio values or will highlight an anomaly in its chemical compositions. Usually, this approach is associated with a set number of analyses and the use of chemometrics. While another approach is by searching a specific marker in food products, either chemical constituents or morphological components, which proves the presence of adulterants in food products. The third approach, is by using analytical methods derived from physical analysis by taking into account the whole samples to show the adulteration effects on the physic-chemical properties (Cordella *et al.*, 2002).

The analytical methods used for the detection of adulteration of oils and fats including lard are based on the differences in the nature and the composition of the minor and major components of the adulterant and those of the unadulterated oils or fats. These methods usually depend on their physical-chemical constants or based on chemical and biological measurements (Kowalski, 1989).

The advance in food technology had progressed so much and getting more complicated. All sorts of ingredients had been used in foods which are difficult to understand by the consumer, unless they are

involved directly in the related field. In addition, the task of halal authentication cannot rely only on expertise from shariah alone, but also require other related technical fields such as food science and technology, chemistry and veterinary science. Halal authentication cannot rely solely on physical inspection and documentation anymore, but also using the latest high technology analytical instrumentation.

In the analytical field, there were many principal techniques that have been successfully applied to detect and identify porcine based ingredients adulteration in food. Che Man & Mirghani (2001) have developed a Fourier-transform infrared (FTIR) spectroscopic method for detecting lard in mixtures of other animal fats, such as chicken, lamb and cow. The results demonstrated that the FTIR could qualitatively differentiate between the pure animal's fats and their blends. Syahariza *et al.*, (2005), successfully applied the FTIR spectroscopy technique with combination of attenuated total reflectance (ATR) and partial least square (PLS) to detect lard adulteration in chocolate and chocolate products. The effectiveness of using DNA-based technology such as polymerase chain reaction (PCR), for species identification in meat and fats has also been successfully carried out by Aida *et al.*, (2005). They have developed a PCR method for species identification from pork and lard samples and shown to be potentially reliable techniques for detection of pig meat and fat for halal authentication.

Besides that, chromatographic techniques such as Gas Chromatography and High Performance Liquid Chromatography (HPLC) also have been employed in halal authentication. The ability of the HPLC technique to monitor the triacylglycerol (TAG) compositional changes in the oil samples before and after adulteration was studied by Marikkar *et al.*, (2005). The results showed that qualitative determination of lard contamination in palm kernel oil (PKO) was possible by a visual comparison of TAG profiles of PKO adulterated with different animal fats with those of the animal fats. Recently, Indrasti *et al.*, (2010) used a highly sophisticated chromatographic technique, GC × GC-TOF-MS, to study the fatty acid profiles of lard (LA) in comparison with other animal fats such as chicken (CF), cattle (CA) and goat fat (GF). As a rapid, non destructive analysis tool, electronic nose also attempted to be used for food authentication. The work by Che Man *et al.* (2005) was successfully detected quantitatively the refined bleached deodorized (RBD) palm olein samples adulterated with lard (as low as 1 %) using the zNose™. A two-dimensional olfactory image called VaporPrint™, produced by the The zNose™ could be used for immediate detection (qualitatively) of lard substances in sample admixtures.

6. Conclusion

As conclusion, the adulterations of pig sources in food products are prohibited in Islam. From the Islamic point of view, this prohibition includes all part of pig such as flesh, skin, and also its derivatives (lard, enzyme and others). Hence, products that contained lard have to be clearly stated in food labeling. Several techniques have been developed to assist consumers in choosing food products. For instance, FTIR, HPLC, PCR and others. Muslim researchers should have an urge to explore the detection techniques in food adulteration in order to protect Muslim consumers in choosing food products for their consumption.

7. References

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