International Food Research Journal 24(Suppl): S305-S312 (December 2017)
Journal homepage: *http://www.ifrj.upm.edu.my*

Nutritional perspectives of early Muslims' eating habits

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Article history

Received: 6 December 2016
Received in revised form: 9 March 2017
Accepted: 10 April 2017

Keywords

Halal
Nutrition
Islam
Eating Habit

Abstract

In recent time, there has been a great influx of numerous processed foods into the market. The utilization of improved technologies in food ecosphere has not only led to the emergence of complex foods but has also raised concerns about their nutritional, safety and halal status among consumers. Consumers are confused whether to reject or adopt the proceesed foods and have become divided into various groups based on their eating habits. In order to ameliorate their concerns, consumers seek the adoption of knowledge-based eating habits. This review provides details on the nutritional perspectives of eating habits by early Muslims. Islam, as a complete way of life, entails well-defined eating habits as a comprehensive guide for mankind.

Introduction

Our eating habit has changed greatly compared to that of the early generation. The emergence of new life-threatening and nutritional-related diseases is an indication that something has gone wrong in our way of life including eating habit. It is part Islamic principle that we adopt the practice from the early Muslims' way of life in order to stay on track of Islamic dictates. Learning from the past and following the good manners of the previous Muslims have been an approach recommended by Islamic principles (Habib *et al*., 2011). However, many people only focus on religion rituals without considering some other important aspects like their eating habit.

Islam, as a complete way of life, has provided numerous guidelines on how we interact with food. These guidelines can be found in the Quran: the divine revelation of Islam; the Hadiths: the records of the way of life of the Prophet; and the way of life of his predecessors. In a recent time, the eating habit of early Muslims is not only considered as healthy and recommended (Shah Alam and Mohamed Sayuti, 2011). The reasons for this might be due to the consumption of a small amount of food, eating of nutritionally healthy fruits and oil, adoption of safe eating manners, avoidance of alcohol and other toxic substances.

The advent of volumes of scientific data on food nutrition and utilization has broadened our understanding and shaped our interaction with food. Currently, we have been able to associate some health issues with our food intakes. However, the motive of food choice is mostly driven by intuition, cultural and environment (Gibson and Cooke, 2017). A lot has changed over the years. The agricultural technology has enhanced food productions and thus makes food to be available in abundance. The processing methods for food production have become advanced. The present day Muslims still strive to adopt early Muslim's way of life. Healthy eating habits of the past can be easily adopted by the present day Muslims if explained in the light of scientific evidence. This review is thus aimed at unraveling and substantiating the nutritional perspectives of early Muslims' eating habits in the light of contemporary and modern health issues.

Food choice of early Muslims

Rejection of alcohol and other related substances

In Islam, the consumption of alcohol is totally forbidden according to the several verses of the Qur'an. Alcohol consumption has been linked to the

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penetration of toxic compounds through the wall of the intestine that later get to the liver where they cause damage. The effect of alcohol consumption only happened when the microbacta in the intestine are present. The mechanism is likely to be that the toxic compounds produced by the microbes are dissolved by alcohol thus allow their passage through the small intestine. Many reports have shown that liver damage associated with alcohol only occurs in the presence of the intestinal microbes.

Epidemiological evidences and neurobiological dissection have established a strong association between substance use (alcohol, cannabis, inhalants and tobacco) during adolescence and later psychopathology such as neurocognitive impairments, permanent and irreversible cognitive deficits, structural brain abnormalities, substance-specific alterations in white matter volumes, deviations in microstructural integrity in white matter tracts, relative decreases in regional gray matter volumes, and deficits in functional connectivity (Lubman *et al*., 2007; Luciana and Ewing, 2015). Other risk behaviors closely linked to the substance use include, but not limited to, heavier types of substance use initiation, disruptions in school, family, and social functioning as well as externalizing disorders.

Specifically, one of the main contributors to the incidence of deaths and injuries of both accidental and suicidal intents during adolescence is alcohol use or alcohol and drug combination (Luciana and Ewing 2015; Al-Abdallat *et al*., 2016; Bajaj *et al*., 2016; Park *et al*., 2017). The use of alcohol in early adolescence as well as the fetal alcohol exposure via maternal drinking are also linked to the prevalence of smoking and an increased incidence of drug abuse such as nicotine dependence in adulthood (Littleton *et al*., 2007). A substantial acute or chronic alcohol intake also severely influences oral sensations and oral dryness (Inenaga *et al*., 2017). Heavy alcohol consumption also leads to heart failure as a result of hypertension, myocardial infarction, and type 2 diabetes mellitus (Djoussé and Gaziano, 2008).

Rejection of pigs and pig products

The consumption of pork and its products is prohibited in Islam except in extreme circumstances involving life and death in which no other alternative is available (Easterbrook and Maddern, 2008). Pigs are known to relish filth and offal thus evince their adverse health impacts on consumers (Al-Qaradawi, 1999). Furthermore, *Clostridium difficile*, a foodborne pathogen which causes antibiotic-associated diarrhea in both humans and animals has been found in patients and pigs especially piglets (Usui *et al*., 2017; Wu *et al*., 2017). Pigs are also the major reservoirs of monophasic variants of *Salmonella typhimurium* (Weaver *et al*., 2017). One of the leading foodborne pathogens in the United States, *Toxoplasma gondii,* was also isolated from pig (Guo *et al*., 2017). In spite of the transmission of numerous pathogens to humans through direct contact with or consumption of pig products, other health concerns regarding swine consumption include the emergence of novel pig-borne pathogens, which are pig-specific with significant zoonotic potential (Pappas, 2013).

Rejection of animal carcass and blood

It is part of the early Muslims' habit not to eat land animal that dies without been killed through slaughtering or hunting. The Halal concept of meat for Muslims is very strick on the method that animals are killed. Generally, animal carcasses are a reservoir of pathogenic microorganisms. For instance, Hauge et al. (2017) reported the detection of *Escherichia coli* from naturally contaminated pork and lamb carcasses, while methicillin resistance *Staphylococcus aureus* has also been isolated from food and wild animal carcasses (Traversa *et al*., 2015). An important food pathogen, *Yersinia enterocolitica* strains, was also isolated from carcasses of large game animals (Bancerz-Kisiel *et al*., 2016).

Furthermore, blood of animals is completely rejected by early Muslims due to the Islamic ruling. In order to ensure high bleed-out and reduced heamoglobin in carcass, Halal slaughtering is preferred to other slaughtering methods like gas-stun-kill (Nakyinsige *et al*., 2014). Also, blood is a suitable growth medium for microorganism, thus surmise increase in microbial loads in carcass with low bleed-out. Increase in microbial count and heamoglobin adversely affect the keeping quality of carcass (Sabow *et al*., 2016).

Reduction in meat consumption

Due to the less consumption of meat by early Muslims, they were known as semi-vegetarians. Their actions could be associated with the lesson learnt from the practice of the Prophet. It is well established in the Hadith literature that the Prophet rarely eat meat, and only ate mostly on special occasions or as a guest. His habitual diet and favorite foods were dates, water, vinegar, honey, yogurt, barley bread, and grapes. As a guest, he was once served gourd (pumpkin) and meat stew, he only picked out the gourd to eat. The Prophet and companions used to look forward to Fridays because a local woman used to serve them a meatless meal as a meat substitute. Umar ibn al Khattaab, the third Caliph, notably stated: "Beware of meat, for it is

addictive like alcohol." He once chastised his son for giving in to his craving and buying meat (Malik and Rahimuddin, 1985).

Children and adolescents require dietary protein, particularly essential amino acids, for growth and development as well as body repair and cell regeneration (Bohrer, 2017). Excessive and high levels of meat consumption, however, contribute to increased risk of non-communicable diseases (Mullee *et al*., 2017). Some epidemiological and experimental studies have also suggested an association between a high intake of meat, especially red and processed meat and an increased risk of colorectal cancer (Kim *et al*., 2013), cardiovascular disease, global obesity epidemic and some forms of cancer (Apostolidis and McLeay, 2016). The consumption of red meat, predominantly processed red meat, has also been associated with an increased risk of type 2 diabetes (Pan *et al*., 2011). The increase in the global meat consumption is, however, due to the growth of the world's population as well as the rising disposable incomes. Nevertheless, such high levels of meat consumption are strongly perceived to culminate into a number of health, ecological, social and environmental concerns such as biodiversity loss, deforestation, high greenhouse gas emissions, and several cases of food safety risks (Hallström *et al*., 2014; Apostolidis and McLeay 2016).

The most sustainable alternative to the high consumption of meat products is dietary changes to meat substitutes, plant-based meat products which look and taste like meat (Apostolidis and McLeay, 2016). Albeit the presence of high polyphenol intake in fruits and vegetables, bioactive dietary compounds in plant-based food products have been linked to a decreased risk for cardiovascular disease, certain cancers, diabetes and age-related degenerative diseases (Ahmed *et al*., 2015; Ahmed *et al.*, 2017). However, it has been reported in the literature that vegetarians may be susceptible to high prevalence of inadequacy for dietary vitamin B12 and iodine as compared to the highest intake of saturated fatty acids, protein, vitamin B2, vitamin B12, vitamin D, zinc, and iodine in the meat eaters (Sobiecki *et al*., 2016).

In essence, moderation is the key issue for balanced status. Though, moderation in eating is considered to be a pragmatic interventional approach to both the prevention of weight gain and weight maintenance (vanDellen *et al*., 2016). It is, however, a complex behavior, which requires an early focus on improving individuals' awareness of their risk behavior prior to targeting such motivational factors (Walthouwer *et al.*, 2015). The traditional Mediterranean Diet epitomizes a sustainable moderation eating pattern. Thus, it was declared an Intangible Cultural Heritage of Humanity by UNESCO in 2010 owing particularly to its economic, environmental and socio-cultural impacts (Benedetti *et al.*, 2016).

Adoption of honey

Honey is a natural sweetening substance produced by honey bees. The bees basically feed on, collect, transform and combine the nectar blossoms or the secretion of the living part of plants with specific substances of theirs and then store and leave them in the honeycomb to ripen and mature. Though the composition of honey depends largely on its floral source and its geographical origin, honey has the highest composition of carbohydrate (82.3%) in the animal products categories. It comprises primarily of the sugars glucose, fructose, maltose, sucrose, kojibiose, turanose, isomaltose, maltulose, as well as oligosaccharides (anderose and panose) in addition to minerals, free amino acids, proteins, vitamins, enzymes (amylase, catalase, oxidase peroxide, and acid phosphorylase), and other numerous volatile compounds. The carbohydrates contained in honey are capable of reducing any perturbations in the immune system with fewer disturbances in blood immune cell counts, lower granulocyte and monocyte phagocytosis and oxidative burst activity, diminished pro- and anti-inflammatory cytokine responses. It has thus become an important nutraceutical and an adjunct to conventional therapies for enhancing the immune function status and general well-being (Adadi and Obeng 2017; Rahim *et al.*, 2017). Honey also has other properties such as antioxidant, antimicrobial, anti-inflammatory, anti-fungicidal, hepato-protective and immune-modulatory (Meo *et al*., 2016; Adadi and Obeng 2017). It is commonly used as food and medicine for both humans and animals as well as for religious ceremonies (Adadi and Obeng, 2017).

Adoption of olive oil

According to the hadith, olive oil is a food and ointment for it comes from a blessed tree" [At-Tirmithi]. Olive oil is highly recognized for its health benefits and folk medicine such as boosting cognitive performance, improving cardio-metabolic markers and reducing the incidence of neurodegenerative diseases, among others (Sena and Juliastuti, 2017). The high monounsaturated fatty acid content of the olive oil is mainly responsible for its beneficial effects. Nevertheless, other minor but highly bioactive components also found in olive oil include the unsaponifiable (non-polar) and the soluble (polar) fraction, which comprises the phenolic compounds

(López-Miranda *et al*., 2010). In addition to the common phenolics of other plants, olive leaves also exclusively contain phenolics belonging to the secoiridoids family. These polyphenols contained in the olive leaves play significant roles in their anti-carcinogenic, anti-inflammatory, antimicrobial (Talhaoui *et al*., 2015; Nsir *et al*., 2017). antioxidant proprieties (Xiang *et al*., 2017), antiarrhythmic, and vasodilatory properties (López-Miranda *et al*., 2010).

Adoption of fruits

The benefits of fruits are well emphasized by the Qur'an 80: 31- 32, (Ali 2011). Fruits and herbage are stated to be a provision and benefit for humans and animals. Fruits like dates, grapes, and pomegranates are mentioned in the Quran. It is a common practice of early Muslims to consume a lot of fruits as major part of their diet.

Globally, the consumption of edible fruits significantly contributes to the nutritional security of mankind (Bhatt *et al.*, 2017). Epidemiological and intervention studies have shown that fruits are important natural sources of phenolic compounds and vitamins with antioxidant properties which are associated with a lower incidence of chronic illnesses such as cancer, coronary heart diseases, cardiovascular disease, toxic liver damage and neurodegenerative ailments, among others (Ahmed *et al*., 2015; Ahmed *et al.*, 2017). Diets rich in fruits also protect and help the body in combating free radicals (Ibrahim *et al*., 2017). The consumption of fruits is also positively associated with cognitive ability owing to the neuroprotective phytochemicals contained in them which can prevent or, at least, delay the onset of cognitive dysfunction during aging (Miller *et al*., 2016). In addition to the health-promoting phytochemicals, essential nutrients and antioxidants contained in the fruits, their taste and aroma are other important benefits that can be gained from the daily consumption of fruits (Chang *et al*., 2016).

Adoption of milk

Milk has formed a very important part of early Muslims food. The short- and long-term benefits of breastfeeding (human milk) to infants are immense and innumerable. While the short-term health benefits include protection, appropriate growth patterns, reduced otitis media, optimal colonization of the intestinal microbiome as well as protection against infectious disease (such as diarrhea and respiratory infection) and all-cause infant mortality, the long-term benefits include reduced risk for obesity and type 2 diabetes in addition to improved scores of cognitive achievement and performance (Young, 2017). The advent of dairy technology has also made the addition of bovine milk fat globule membrane with many bioactive components feasible (Hernell *et al*., 2016). The composition of milk, however, varies between ruminants and non-ruminants. The milk from ruminants (cow, sheep, goat, buffalo, camel, llama, yak and deer), for instance, has a lower lactose content, a higher protein, a higher share of saturated and mono-unsaturated fatty acids, a higher cholesterol level, vitamin and mineral content as compared to non-ruminants (horse and donkey) (Claeys *et al*., 2014). The intake of dairy products has also been inversely associated with hypertension, stroke and colorectal cancer despite the evidence of a link of high-fat dairy products with an incremental risk of prostate cancer and a weak evidence of the protective effect of dairy products on bone health (Alvarez-León *et al*., 2006).

Adoption of black seeds

The Black seed *(Nigella sativa)* is a widely grown food, culinary spice and medicinal plant owing to its flavorful seeds and leaves. Its seeds and oil are valuable raw materials which are commonly used in the production of new drugs for treatment of many diseases such as asthma, bronchitis, cough, diabetes, digestive diseases, fever, lactagogue, headache, vermifuge, inflammatory diseases and rheumatoid arthritis (Kooti *et al.*, 2016).

The other biological and pharmacological effects of the black seed, reported in the literature, are antimicrobial, antibacterial, antiproliferative, proapoptotic, anticancer, antioxidant, anti-diabetic, anticonvulsant, antiepileptic, anti-inflammatory, anti-hyperlipidemic, anti-hypertensive, wound healing and analgesic activities, in addition to its beneficial effects on the central nervous, reproductive, digestive and immunes systems (Gholamnezhad *et al*., 2016, Kooti *et al.*, 2016). It is an excellent alternative source of essential fatty acids. The seeds' composition include 29.1% as fixed oil (with 85% of total unsaturated fatty acid), 26.1% crude protein and 31.2% total carbohydrates. Myristic, palmitic, stearic, oleic, linoleic, and linolenic are the major fatty acids in the seed oil while the seed meal, which is very rich in lysine, methionine and threonine, contained a total of 23 amino acids (Kooti *et al*., 2016).

Eating behavious of early Muslims

Avoid excessive eating

According to verses of Qur'an and Hadiths, the quantity of food to be consumed should be kept at a

moderate level. Muslims have been advised to avoid excessive eating and drinking in Qur'an 7:31, 20:81 (Ali, 2011) and the stomach of Muslim should be filled to one third. In fact, believing in Islamic faith is associated to having one stomach compared to seven of non-Muslim al-Bukhaari 5081 (Al-Bukhaari, 1983) and Muslim 2060 (Siddiqui, 2008) . According to the early Islamic scholars, one of the worst habits is filling of stomach to fullness and thus, they have suggested that human should consume few bites that is enough to quench hunger. Also, the hadith also stated that eating less has direct association with being healthier and the earlier Islamic scholars recognized that over-indulgence in food causes many diseases . Control of excessive eating has relationship with the eating manners. Therefore, it was suggested that individuals should not sit for food unless when such person is hungry and proper chewing of food particles should be done. The prohibition of excessiveness and extravagance in eating and drinking is general in meaning, scope and concept and does not apply to any particular type of food or drink. Islam rather encourages moderation.

Cognitions and emotions greatly affect eating behavior and may impede people's ability to control their eating (Antoniou *et al.*, 2017). For instance, secretive eating is associated with depression and usually results in binge eating, which, in turn, portends heightened risk of weight gain and eating disorder onset (Kass *et al.*, 2017). The severity/frequency of overeating and binge eating is also more to negative emotional eating than positive emotional eating (Sultson *et al.*, 2017). Eating in the absence of hunger has also been a relevant and major target for reducing food intake in obese individuals (Goldschmidt *et al.*, 2017). Some of the medical complications and health risks associated with binge eating are cardiovascular disease, diabetes, metabolic syndrome, increased levels of morbidity and mortality, as well as increased likelihood of mood and anxiety disorders in addition to decreased quality of life (Berner *et al*., 2017).

Eating in group

Another eating manner commonly practiced by earlier Muslims is the eating in congregation. This is in line with the suggestion of Prophet Muhammad that eating together increases love among siblings (Malik and Rahimuddin, 1985). The quality of life has been shown to be associated with food enjoyment. While a high frequency of eating alone is associated with depression and loss of appetite, eating in groups or in the presence of others which is otherwise referred to as the "social facilitation of eating" brings about positive mood such that people tend to enjoy the food-taste better and eat much more of it. Such social facilitation of eating when people eat together in company typically allows cordial communication, social bonding, and helps people feel more comfortable and relax especially when the other individuals are friends or family members (Nakata and Kawai, 2017).

Drinking of water

Water plays important functions for complete digestion and utilization of food in human. There are numbers of Islamic guidelines on drinking of water that have been found useful by early Muslims. The guidelines include calmness and gradual drinking of water (not in one gulp), drinking water earlier before meal, avoiding the breathing into water during drinking and avoiding a reclining position while drinking. There are some scientific evidences that are recently available to strengthen the benefits of the aforementioned guidelines. Drinking of water 30 minutes before meal provides enough moisture for creation of acid solution in the stomach, this will allow for denaturation of proteins in food. However, introduction of water during eating might lower the pH as the stomach acid becomes diluted thus slowing down the protein denaturation as well as the optimum conditions for trypsin enzyme to act. Although future works are needed to ascertain the concept of the duration and water intake during eating.

It is also stated that that water creates the source of hydrogen ions of the gastric juice needed to react with chlorine to form acid in this stomach. This reaction takes place at the pericanaliclar zone round the intracellular canaliculi of oxyntic cell. The hydrogen ions are largely from water (Davies, 1951).

Mixture of water with acid is an exothermic reaction and this explains why acid is supposed to be added to water in the laboratory. However, water can only be added to stomach acid, but not the other way round. Hence, in order to avoid sudden heat generation, water should be introduced to the stomach gradually. This will give time for the stomach content to ameliorate the change in temperature. The rush toward drinking of water might result into generation of heat that might harm the stomach wall as well as the trypsin enzyme.

Conclusion

This review has provided scientific evidences to the wholesome practices and nutritional perspectives of early Muslims' eating habits as related to the concept of halal. Admittedly, only few items were covered in this review.

Conflict of Interest

There is not conflict of interest.

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