

How do Muslims consume dates?

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ABSTRACT

Background. It is recommended that Muslims consume dates. Many studies have proven the benefits of date consumption. However, many Muslims have not implemented these recommendations with many more consuming dates in a manner not in accordance with Islamic recommendation.

Aim: To identify gaps between Muslims' habits and Islam's recommendation in the context of date consumption.

Method. A mixed method study with sequential exploratory strategy has been used in this study. The qualitative design used a phenomenology approach while the quantitative design used a cross-sectional approach. Research subjects were Muslims who had consumed dates. The sampling technique was carried out by purposive sampling. A total of 42 Muslims were involved in in-depth interviews and 904 questionnaires were analyzed.

Results. The finding in this study describes Muslims' experience in getting dates; reason and way in consuming dates; amount of time in consuming dates including the experience for the first time, the regularity of consumption and the time consuming habit; number of dates consumed by the subjects daily, obstacles faced by Muslims in obtaining dates; and the benefits of dates.

Conclusion. There are gaps between Muslims' habits and Islam's recommendations in consuming dates. Regular date consumption is not only able to fulfil the spiritual need but also nutritional needs of the human body.

Keywords: Dates, consumption, Muslims, behaviour, Islamic shari'a, experience, reason, way, time

INTRODUCTION

Al-Hooti et al. reported that there are around 2,000 cultivars of dates in the world¹. However, Nasir et al. reported that there are about 5,000 famous date cultivars in the world². Those dates originate from Asian, the Middle East, and North Africa. The most popular dates in Pakistan are Aseel, Begum Jangi, Dhakki, Karabalian, Fasli, Muzawati and Halawi. Popular dates from Iran include Shahani, Khasuei, Sayer, Zahedi, Shekar, Shahabi, Kabkab, Khenizi, Maktub, Kabkab Dalaki 2, Shahabi 2, Majhool, Gofar, Lasht³, Bamy^{4, 5}; and from Iraq Shorcy and Tamriq^{4, 5} from Saudi Arabia Rotanah Alshara, Rabeaah, Shalaby, Mabroom, Anabarah, Sukkary, Suqaey, Sofry, Safawy^{4, 5} and Barny⁴. Algeria produces Deglet Nour (semi-soft dates), Ghers (soft-dates) and Degla Beida (dry dates)⁶; and from Tunisia Goundi, Ikhout, Lagou, Touzerzaillet, and Tranja⁷, Alligh⁷⁻⁹, Deglet Nour, dan Khenizi^{7, 8}; and from Egypt (Mesir) are Lobanah Masery⁵ and Saidi¹⁰. Variation of cultivars and growth conditions, produce dates that vary in shape, size, weight and moisture content^{11, 12}. Nevertheless, the developmental stage of dates is the same. Before maturing, dates pass five stages of development (Table 1, Fig. 1). Of the five stages of development, there are three stages that dates can be eaten, namely *Khalal*, *Ruthab* and *Tamr*^{13, 14}.

Physically, dates are divided into three main parts, namely skin, flesh and pit¹⁵ while commercially, dates are divided into three groups, namely soft date (SD), semi-dry date (SDD) and dry date (DD). This grouping is based on the external quality of the texture, flexibility and the ratio between the levels of glucose, fructose and sucrose at the *tamr* stage and the water and fiber content^{11, 12}. The decrease in water content is closely related to the date preservation method. Natural preservation is executed to extend the stability, shelf life, quality and taste of dates. The main method often used to preserve dates is through sun drying and freezing methods. Other ways that have been conducted to preserve dates include 1) *Dabal* done by drying fresh dates under the sun for 2 days; 2) *Khamal* is done by soaking fresh dates in boiling water for 10 minutes, followed by drying and placing dates that have been soaked in a moist container covered by a thick and wet hemp cloth, reversed and exposed to direct sunlight for 7 hours; 3) *Wet saloque* where fresh dates are placed in boiling water for 90 minutes (with a ratio of 1:5, dates: water), followed by drying and cooling in room temperature; 4) *Sun-dried saloque*, fresh dates are first treated as wet saloque but followed by subjecting the boiled dates to direct sun-drying for 3 days; and 5) *Frozen* which is done by freezing at minus 20°C for 1 month¹⁶.

For Muslims, dates are a very popular fruit and are highly recommended to be consumed regularly. In the Qur'an, the Muslim

holy book, the word 'date' is mentioned in 14 verses, 'date fruit' mentioned in 5 verses, 'date palm' is mentioned in 9 verses, 'forerunner date' is mentioned in 2 verse, and 'date garden' is mentioned in 4 verses. The Messenger of Allah (Rasulullah s.a.w.) said "Indeed, among the many trees, there is a tree that does not fall in its leaves. And that is a parable for a Muslim, then the Prophet Muhammad (s.a.w.) asked, "Tell me, what tree is that?" the companions of the Prophet (s.a.w.) thought that the tree was a tree in the valley. However, Abdullah said, "I thought to myself, that the tree is a date tree, but I am ashamed to express it". Then the companions asked, "O...Messenger of Allah, what is that the tree?" the Prophet Muhammad (s.a.w.) replied, "date palm" (Hadith narrated by Bukhari no. 60).

Table 1. Phase development of dates

Stage	Description
<i>Habbauk</i>	This is the first stage of post conception that lasts for 4 to 5 weeks. At this stage, the dates are immature and completely covered by petals leaving only one sharp tip of the ovary. The dates are the size of nuts and weigh around 1 gram ¹⁷ .
<i>Kimri</i> (unripe) or green stage	In this stage, date development is the longest (9-14 weeks). Dates experience increase in size, color and sugar content. The average fruit length is 27.5 mm and its diameter is 17.8 mm and its texture is quite hard. Its color is green and starts to turn yellow or red at the end of this stage depending on the type of dates. Date fruit has a water content of 80% and 50% of sugar, namely glucose and fructose. Commonly, the taste is bitter and unsuitable to eat ^{2, 17, 18} .
<i>khalal</i> (full-size and crispy) or color stage	This stage lasts for 6 weeks. In this stage, the date color is red, pink or yellow and its texture remains hard. The water content in date fruit decreases slowly (around 50-85% moisture content) and the sucrose starts to be converted into reducing sugars (fructose and glucose). Total soluble solids of dates is 30-45°Brix and the weight gain of date fruit slows down in this stage and the date fruit begins to lose its astringency. In some type of dates, conversion of sucrose is very fast and its taste is better ^{11, 17-19} .
<i>Ruthab</i> (ripe and tender) or soft ripe stage	This stage lasts 2-4 weeks. At this stage, the tip of the fruit begins to turn brown followed by the skin, the dates become soft and further conversion of sucrose to glucose and fructose. The astringency is no longer found with total soluble solids of 55-60°Brix and no longer referred to as fresh dates. Water content decreases (about 35-40% moisture) ^{2, 11, 17-20} .
<i>Tamr</i> (ripe and reduced humidity)	This stage is the final stage of date maturation and fully ripped with a total soluble solids of 60-84°Brix. Dates look dehydrated. Semi-dry and dry dates have about 50% sucrose and reducing sugars and 10-20% moisture. In one date stem, the fruit may mature after one month and not simultaneously ^{11, 17, 18, 20, 21} .

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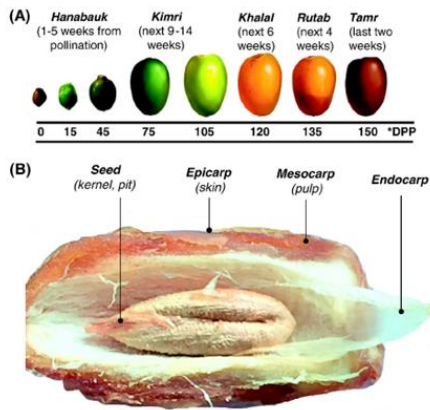
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Many studies have proven the benefits of date consumption^{18, 19, 22, 23}. However, there are still many Muslim who have not implemented it yet and also who implemented it but not in accordance with Islam's recommendations. This study aims to identify gaps between Muslim consumption habits and Islam's recommendations in consuming dates. The findings in this study are expected to give inputs and considerations for other Muslims who wish to implement Sunnah in Islam as exemplified by the Prophet (s.a.w.).

Fig 1. Different stages of date development according to DPP* (days post-pollination) (A) and anatomical dates at Tamr stage (B)
Source: Ghnimia et al.¹³ and Al-Mssallem et al.¹⁴



METHOD OF STUDY

Table 2. Characteristics of respondents (n = 904)

Characteristic	f (%)
Age (years old)	
≤20	113 (12.5)
>20-30	379 (41.9)
>30-40	214 (23.7)
>40-50	143 (15.8)
>50	55 (6.1)
Education	
Elementary school	4 (0.4)
Junior high school	8 (0.9)
Senior high school	371 (41.0)
Diploma 1	3 (0.3)
Diploma 2	2 (0.2)
Diploma 3	152 (16.8)
Diploma 4	18 (2.0)
Bachelor	197 (21.8)
Master	143 (15.8)
Doctoral	6 (0.7)
Occupation	
Unemployed	10 (1.1)
Housewife	100 (11.1)
Retired	9 (1.0)
Labor	1 (0.1)
Student	247 (27.3)
Farmer	1 (0.1)
Online driver	1 (0.1)
Honorary	9 (1.0)
Private employees	148 (16.4)
Hijamah therapist	3 (0.3)
Indonesian national army	2 (0.2)
State civil apparatus	175 (19.4)
Teacher/lecturer	103 (11.4)
Entrepreneur	43 (4.8)
Flight attendant	1 (0.1)
Sailor	1 (0.1)
Geologist	1 (0.1)
Advocate	1 (0.1)
Health worker (doctor/midwife/nurse)	48 (5.3)

This study used a mixed method with sequential exploratory strategies where the research starts with a qualitative study followed by a

quantitative study. Qualitative design used a phenomenological approach to explore the habits of Muslims in consuming dates. Participants in this study were Muslim communities who had consumed dates. The sampling technique was carried out by purposive sampling. Qualitative data collection was carried out in November 2017 to January 2018 in the village of Bojong Kulur, Kecamatan Gunung Putri, Bogor, West Java, Indonesia. A total of 42 Muslims were involved in a 30-45 minutes in-depth interviews at the participants' house. The data was processed and verified by triangulation method.

The results of the analysis of qualitative data were then converted into a questionnaire to be confirmed through a quantitative study. A cross-sectional approach was used in the quantitative designs. Quantitative data collection was carried out from February to May 2018 using a web-based questionnaire that had been set up. Thereafter, the data obtained was examined regarding the completeness and suitability of the fillings. A total of 956 Muslims completed the questionnaire and 904 of the collected questionnaires were considered to meet the criteria to be analyzed (the characteristics of respondents can be seen in table 2), while 52 of others have been issued because they do not have the suitability of the data.

RESULT

Experience in getting dates: Respondents claimed to buy dates from supermarkets, minimarkets, herbal shops, traditional and/or modern markets, online shops, Islamic shops, fruit shops, wholesale date stores, pharmacies and direct orders from friends in Arabia but some others obtained dates free as Hajj or Umrah gifts. Types of dates consumed are Mazafati, Siwi or Samani, Safawi, Fard, Lulu, Majhool, Khalas, Khenaizy, Sukkari, Sayer, Tunisia and Ajwa. The price of dates purchased by respondents varied, greatly from Rp. 9,000 per box of 100 grams (bulk dates) to Rp. 400,000 per kg. "I always stock dates at home, sometimes I buy Sukkary dates which costs 150,000 per kg or if I have more money, I buy Ajwa dates which costs Rp. 400,000 per kg" (participant 30). Therefore, quantitative data indicate that the most consumed type of date is Ajwa (23.5%). However, most respondents (51.5%) claimed they did not know the type of dates they consumed (Table 3).

Reasons and ways in consuming dates: The reasons expressed by participants in consuming dates was to implement Islamic shari'a eating habits, family habits, like the taste, for health and availability of dates at home (bought by parents and some received gifts from neighbors or relatives returning from Hajj or Umrah. "At first we only intended to follow the Sunnah but after knowing the many benefits of dates for health, now it becomes a habit in our family. We began to consume dates since 2 years ago" (participant 18). This information is supported by quantitative data where most respondents (71.8%) consumed dates because they followed the sunnah taught by the Messenger of Allah (Table 4).

Furthermore, there are many ways to consume dates based on the participants' individuality, some split the dates into two first and then discard the seeds and clean the inside of the dates before eating, whilst some eat dates and remove the date pit from the mouth, some bite a date little by little, and some make dates become naqi' water then drink it. Others, mix dates with milk and some make dates into juice. "I usually make dates into naqi' water by soaking them for 8-10 hours. So if they are soaked in the afternoon, it can be drunk in the next morning and if they are soaked in the morning, it can be drunk in the evening" (participant 35). Quantitative data analysis shows that most respondents (48.3%) consume dates by directly biting the date flesh bit by bit (Table 4).

Experience of date consumption at the first time and routine (time): Some participants claimed that they have been introduced dates by their parents since they were newborn babies (tahneek), and some participants were newly introduced at childhood or adolescents, while but some others just known dates after they were adults. "My parents said when I was born, they did tahneek to me and they asked me to do the same thing (tahneek) to my children" (participant 40). From quantitative data, most participants (53%) had consumed dates regularly, especially during the fasting month (88.2%) (table 5).

Consumption time habits (time): The time habit of respondents in consuming dates varies greatly. "Our families usually consume dates, when we break our fast (iftar) and before Eid prayer or when we are not feeling well" (participant 16). From the quantitative data, it is known that outside Ramadhan, 59% of respondents choose not to set a specific time in consuming dates or anytime when they want it. However, during

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the Ramadhan, most respondents prefer to consume dates when it is iftar (94.4%) because they believe that iftar is the best time to consume dates (63.3%) (Table 6).

Number of dates recommended for consumption: Muslims are advised to consume odd amounts of dates as narrated by Bukhari from Anas bin Malik that "on the Eid of the Prophet Muhammad s.a.w. did not leave to pray until he ate a few dates". Murajja' bin Raja' said; "Ubaidullah has told me that Anas said, the Prophet s.a.w. ate some dates with odd numbers" (Hadith narrated by Bukhari no. 990). However, it is more recommended for Muslims to consume 7 date fruits as narrated by Bukhari and Abu Daud from Amir bin Sa'd bin Abu Waqqash that the Prophet (s.a.w.) said "whoever consumes 7 Ajwah dates in the morning, then he will not be exposed to poison or magic on that day" (Hadith narrated by Bukhari no. 5025 and Abu Daud no 3378).

The findings in this study show only 7.1% of respondents consumed an average of 7 dates per day (Table 7). This is because consuming 7 items of dates per day is not an easy thing to do. This was expressed by the participants who reported that they had difficulty in consuming 7 dates because the amount was considered too much, some participants were not too fond of dates, considered dates too sweet, and some not accustomed to consuming seven dates. Others complained about the price of expensive dates, and there were participants who worried about experiencing toothache or diabetes if consuming a lot of dates, some cited that dates are difficult to get and the supplies limited so if they wished to consume dates every day, they should save the dates. "It is difficult for me to consume 7 dates because I usually only eat 3 of them and I already feel full" (participant 9). It is reinforced by quantitative data that as many as 53.1% of respondents experienced difficulties in consuming 7 dates per day (Table 7).

Table 3. Experiences in getting dates (n=904)

Aspect	f (%)
Place to buy dates*	
Supermarket	255 (28.2)
Minimarket	295 (32.6)
Herbal shop	42 (4.6)
Market	164 (18.1)
Online shop	48 (5.3)
Islamic shop	123 (13.6)
Fruit shop	28 (3.1)
Wholesale date stores	22 (2.4)
Order from Arabic countries	8 (0.9)
Pharmacies	1 (0.1)
Hajj or Umrah gifts	19 (2.1)
Date price (in thousand Rupiah)	
Do not know	15 (1.7)
≤50 per box	305 (33.7)
>50-100 per box	495 (54.8)
>100-150 per box or kg	17 (1.9)
>150-200 per kg	38 (4.2)
>200-250 per kg	4 (0.4)
>250-300 per kg	16 (1.8)
>300 per kg	14 (1.5)
Types of dates*	
Mazafati	2 (0.2)
Siwi atau Samani	2 (0.2)
Safawi	1 (0.1)
Fard	1 (0.1)
Lulu	13 (1.4)
Majhool	9 (1.0)
Khalas	40 (4.4)
Khenaizy	14 (1.5)
Sukkari	26 (2.9)
Sayer	18 (2.0)
Tunisia	171 (18.9)
Ajwa	212 (23.5)
Do not know	466 (51.5)

Note: *) Some respondents choose more than 1 option

Difficulties in getting dates: The extent of the State of Indonesia and the unequal geographical conditions make the distribution of dates uneven so that it is not surprising that in certain regions and at certain times, dates are difficult to obtain. This compelled some participants to replace dates with date extracts or pre-packaged date

drink such as 7dates. 7dates is a date drink packaged that circulates and is widely available in the Indonesian market. This product only contains dates and water and has been certified by The Assessment Institute for Food, Drugs, and Cosmetics of Indonesian Ulama Council. "If in Ramadhan, dates are sold in many places such as mini markets and markets but when it is not in Ramadhan, it is a bit difficult to get them so we replaced them with date extracts and 7dates while we are traveling out of this city" (participant 17). Quantitative data shows that the majority of respondents did not encounter problems in obtaining dates during the Ramadhan both in the area of origin (95.4%) and in their current residence (97.3%) (Table 8).

Table 4. Reasons and ways in consuming dates (n=904)

Aspect	f (%)
Reason*	
Available at home	14 (1.5)
For health	94 (10.4)
Like the taste	106 (11.7)
Family habit	171 (18.9)
Follow Sunnah	649 (71.8)
Way	
Halved-cleaned-seeded-eaten	179 (19.8)
Eat dates directly and remove date pit from the mouth	265 (29.3)
Bite a date little by little	437 (48.3)
Naqi' or nabeez or infused water	17 (1.9)
Mix dates with milk	2 (0.2)
Make dates into juice	4 (0.4)

Note: *) Some respondents choose more than 1 option

Table 5. Experience of date consumption at the first time and routine (n=904)

Aspect	f (%)
First time consuming dates	
Since childhood (≤12 y.o)	636 (70.4)
Since adolescence (>12-21 y.o)	158 (17.5)
After adult (>21 y.o)	110 (12.2)
Current routine consumption	
No	425 (47.0)
Yes	479 (53.0)
Date consumption during Ramadhan	
Yes	797 (88.2)
Sometimes	70 (7.7)
No	37 (4.1)

Note: y.o (years old)

Table 6. Time habits in consuming dates (n=904)

Aspect	f (%)
Consumption habits*	
Whenever they want it	408 (45.1)
During pregnancy	3 (0.3)
During childbirth	1 (0.1)
During lactation	1 (0.1)
During postpartum	1 (0.1)
When they do not feel healthy	7 (0.8)
When there are date stock	11 (1.2)
During Ramadhan	378 (41.8)
Every month	39 (4.3)
Every week	25 (2.8)
When break Sunnah fasting	6 (0.7)
Almost every day	3 (0.3)
Every day	33 (3.7)
Consumption time*	
Ucertain	533 (59.0)
Morning	138 (15.3)
Noon	16 (1.8)
Afternoon	122 (13.5)
Evening	256 (28.4)
Consumption time during Ramadhan	
When Iftar	853 (94.4)
When dawn (sahur)	374 (41.4)
After tarawih prayer	12 (1.3)
Do not consume	35 (3.9)
The best time to consume dates (opinion)*	

Aspect	f (%)
Do not know	100 (11.1)
Every day	11 (1.2)
When Iftar	572 (63.3)
When sahur	164 (18.1)
Morning	198 (21.9)
Noon	4 (0.4)
Afternoon	23 (2.5)
Evening	51 (5.6)
Before/after Dhuha prayer	10 (1.1)
Before eating/on an empty stomach	41 (4.5)
Before sleep/when wake up	17 (1.9)
During pregnancy	4 (0.4)
During childbirth	4 (0.4)
Newborn baby (tahneek)	7 (0.8)
During lactation	1 (0.1)
When feel unhealthy	6 (0.7)
After to do sports	1 (0.1)
Monday, Thursday and Friday	1 (0.1)
Before the Eid prayer	3 (0.3)
During Hajj	1 (0.1)

Table 7. Number of dates consumed and constraints faced in getting dates (n = 904)

Aspect	f (%)
Minimal amount of consumption	
1 item	245 (27.1)
2 items	150 (16.6)
3 items	362 (40.0)
4 items	30 (3.3)
5 items	72 (8.0)
6 items	11 (1.2)
7 items	34 (3.8)
Average amount of consumption	
1 item	65 (7.2)
2 items	129 (14.3)
3 items	396 (43.8)
4 items	68 (7.5)
5 items	156 (17.3)
6 items	17 (1.9)
7 items	64 (7.1)
>7 items	9 (1.0)
Maximal amount of consumption	
1 item	13 (1.4)
2 items	60 (6.6)
3 items	187 (20.7)
4 items	82 (9.1)
5 items	244 (27.0)
6 items	45 (5.0)
7 items	158 (17.5)
>7 items	115 (12.7)
Constraints on consumption of 7 dates	
Less stock of dates	118 (13.1)
Not too fond of dates	39 (4.3)
Too sweet	38 (4.2)
Too much	182 (20.1)
Fast full	19 (2.1)
Not accustomed to	8 (0.9)
Difficult to get it	25 (2.8)
Expensive dates	41 (4.5)
Health worry (toothache/diabetes)	10 (1.1)
There are no obstacles	424 (46.9)

Table 8. Regions and barriers in obtaining dates (n = 904)

Aspect	f (%)
Origin province	
Aceh	2 (0.2)
Noth Sumatera	10 (1.1)
Riau island	2 (0.2)
Riau	36 (4.0)
Bengkulu	4 (0.4)
West Sumatera	41 (4.5)
Jambi	422 (46.7)
South Sumatera	34 (3.8)

Aspect	f (%)
Lampung	57 (6.3)
Jakarta	56 (6.2)
Banten	30 (3.3)
West Java	70 (7.7)
Central Java	44 (4.9)
Yogyakarta	11 (1.2)
East Java	46 (5.1)
Bali	1 (0.1)
Central Kalimantan	2 (0.2)
West Kalimantan	3 (0.3)
South Kalimantan	3 (0.3)
East Kalimantan	1 (0.1)
South Sulawesi	18 (2.0)
Central Sulawesi	1 (0.1)
Maluku	1 (0.1)
West Nusa Tenggara	8 (0.9)
West Papua	1 (0.1)
Barriers in obtaining dates in <u>origin province</u> when it is <u>not in Ramadhan</u>	
No	694 (76.8)
Do not know	6 (0.7)
Yes	204 (22.6)
Barriers in obtaining dates in <u>origin province</u> when <u>in Ramadhan</u>	
No	862 (95.4)
Do not know	3 (0.3)
Yes	39 (4.3)
Current residence	
Aceh	2 (0.2)
North Sumatera	3 (0.3)
Riau Island	4 (0.4)
Riau	41 (4.5)
Bengkulu	3 (0.3)
West Sumatera	4 (0.4)
Jambi	468 (51.8)
South Sumatera	15 (1.7)
Lampung	44 (4.9)
Jakarta	65 (7.2)
Banten	49 (5.4)
West Java	106 (11.7)
Central Java	24 (2.7)
Yogyakarta	12 (1.3)
East Java	32 (3.5)
Central Kalimantan	2 (0.2)
West Kalimantan	1 (0.1)
South Kalimantan	3 (0.3)
East Kalimantan	1 (0.1)
South Sulawesi	15 (1.7)
Central Sulawesi	1 (0.1)
Gorontalo	1 (0.1)
West Nusa Tenggara	8 (0.9)
Barriers in obtaining dates in <u>current residence</u> when it is <u>not in Ramadhan</u>	
No	738 (81.6)
Do not know	5 (0.6)
Yes	161 (17.8)
Barriers in obtaining dates in <u>current residence</u> when <u>in Ramadhan</u>	
No	880 (97.3)
Do not know	1 (0.1)
Yes	23 (2.5)

Benefits of date consumptions: Father of Hisyam bin 'Urwah has told us from his father, in 'Aisyah radhiyallahu 'anha (r.a.), where the Prophet (s.a.w.) said, "A house that there are no dates on it, the inhabitants are hungry people" (Hadith narrated by Abu Daud no. 3335). Dates are not only beneficial for relieving hunger but also have many benefits for human health. Perceived experiences by participants after consuming dates vary greatly, including being more powerful, feeling healthier, feeling full faster, having a better mood, comfort in the stomach, defecating smoothly, increasing appetite, reducing dizziness during menstruation, and more milk production. But there are also participants who felt no change after consuming dates. Respondents

believe that consuming dates can provide many health benefits (Table 9).

Table 9. Respondents' experiences and beliefs about the benefits of dates (n = 904)

Aspect	f (%)
Participants' feeling after consuming dates*	
Ordinary	296 (32.7)
More powerful	455 (50.3)
Feels healthier	107 (11.8)
Fast full	63 (7.0)
The mood is better	35 (3.9)
Comfortable in the stomach	11 (1.2)
Defecate smoothly	4 (0.4)
Appetite increases	1 (0.1)
Dizziness decreases during menstruation	1 (0.1)
More milk production	2 (0.2)
Benefits of dates (opinion)*	
Increase body stamina	162 (17.9)
Fertility	7 (0.8)
Stabilize blood sugar	41 (4.5)
Stabilize blood pressure	19 (2.1)
Contains lots of vitamins and minerals	54 (6.0)
Source of antioxidants	17 (1.9)
High fiber	34 (3.8)
Diet	52 (5.8)
Body immunity	13 (1.4)
Body detoxification	5 (0.6)
Energy sources	192 (21.2)
Magic antidote and genie	17 (1.9)
Beauty	3 (0.3)
Relieve heat	5 (0.6)
Overcoming gastritis	9 (1.0)
Strengthens the uterus	1 (0.1)
Prevent hypoglycemia in newborns	1 (0.1)
Smooth labor	14 (1.5)
Accelerate uterine involution	1 (0.1)
Increase exclusive breastfeeding	10 (1.1)
Increase Hemoglobin levels	67 (7.4)
Increase platelets	8 (0.9)
Increase body weight	3 (0.3)
Increase concentration	2 (0.2)
Increase appetite	2 (0.2)
Improve mood	4 (0.4)
Has a relaxation effect	4 (0.4)
Lowers cholesterol	4 (0.4)
Prevention of diseases	2 (0.2)
Body metabolism	21 (2.3)
Maintain healthy skin	5 (0.6)
Maintain eye health	4 (0.4)
Maintain bone health	26 (2.9)
Maintain lung health	1 (0.1)
Maintain healthy nerves and muscles	2 (0.2)
Smooth urinate and bowel movements	65 (7.2)
Treatment of liver disease	2 (0.2)
Anti allergy	2 (0.2)
Do not know	287 (31.7)

Note: *) Some respondents choose more than 1 option

DISCUSSION

The findings in this study are in line with Roektingroem and Hastuti's study that the types of popular dates in Indonesian markets include dates of Ajwa, Dabbas, Khalas, Khenazi, Lulu, Majhool, Golden Valley (types of Siwi or Samani), Nagel, Safavid, Sayer, and Tunisia²⁴. From all type of dates consumed, participants have varied ways of consuming dates. Of the six ways to consume dates by respondents, two of the ways are in accordance with Islamic recommendations, namely removing date pit and cleaning date from lice and caterpillars (if any) before being eaten and making it into *naqi'* water. Another way that is recommended in Islam to consume dates are set up below in table 10.

A small percentage of respondents have difficulty in acquiring dates both in their original provinces or at their current residences. The findings of this study are in line with previous studies where the respondents experienced difficulties in obtaining dates so that they replaced dates with other sweet substances such as honey and packaged date extract to do *tahneek* to their babies²⁸ and as a source of energy during labor³⁴. Date palm plants generally grow in dry and semi-dry areas in the world⁹ whereas Indonesia is a tropical country and relies on date palm imports from Pakistan, the Middle East and North Africa. These conditions make obtaining dates difficult and makes dates relatively more expensive.

For the people of Middle East and North Africa, dates have been consumed as food for 6000 years^{35, 36} even used as a staple food^{3, 9} as well as used as traditional medicine because of its nutritional value contained in dates¹⁸. Physical characteristics and chemical composition between varieties and maturity stages of dates are very varied^{2, 17, 37}. There is no doubt that dates are perfectly nutritious foods. Surprisingly, the normal food that is commonly consumed by many people is not able to meet the needs of various minerals, vitamins and amino acids¹⁸. However, consuming an average of three dates per day is able to meet these needs³⁸. Even consumption of 100 grams of dates or about 7 dates can meet 50-100% of the amount of daily recommendations⁵. Various macronutrients contained in dates have been summarized from various sources as listed in the table 12.

In Islamic Shari'a, it is not only explained how to consume dates but also the best time to consume them. For Muslims, the tradition of introducing dates since the baby was born is by performing a *tahneek* on the baby. *Tahneek* refers to the Sunnah in Islam which has been exemplified by the Prophet Muhammad s.a.w. and is softening dates by chewing before being given to the baby and then rubbing a small amount of dates into the palate of the baby's mouth. Anyone can do *tahneek* and pray for the baby^{27, 28}. However, the most famous tradition of consuming dates in the world is during the month of Ramadhan. This is also stated by Miller et al. that many Muslims consume dates during Ramadhan, especially when breaking the fast (iftar)²⁹. Other times recommended in Islam for consuming dates can be seen in table 11.

Besides the macronutrients in table 12, dates are also the best mineral source where each mineral has its own health benefits¹⁹. Dates contain many minerals where the percentage of each mineral varies for each type of date¹⁸. The minerals contained in dates are divided into 2 main groups, namely major elements and trace elements (see table 13)⁶⁵.

Of all the benefits of dates believed by respondents, we have summarized the benefits of dates based on previous studies including diet, body immunity, anti-bacterial, maintaining blood health, prevention and treatment of anemia and constipation, diabetes, heart disease, hypertension, gastric ulcer, infection and cancer (table 14).

Table 10. Suggested ways to consume dates based on Islam's recommendations

Way	Description
Remove date pit and clean the date from lice and caterpillars before eating	It is recommended to remove the date pit and clean it from lice or caterpillars before eating. Anas bin Malik said, "The Prophet (s.a.w.) was given the 'Atiq dates, then he examined the dates then removed the fleas from them" and Ishaq ibn Abdullah bin Abu Talha said that "The Prophet (s.a.w.) had ever given dates with caterpillars inside, then he cleaned them before eating" (Hadith narrated by Abu Daud no. 3336). Bani Sulaim also said, "... he (The messenger of Allah) ate the dates and then threw the pits using the backs of his two fingers, namely the index and middle fingers..." (Hadith narrated by Abu Daud no. 3241).
Naqi' or Nabeez water or infused water or the immersion water of dates	Today, infused water is a new trend because it has been proven to provide various health benefits but for Muslims, infused water is not a new thing. Drinking infused water or Nabeez water or Naqi' water or the immersion water of dates is one of the habits exemplified by the Prophet Muhammad (s.a.w.) in his time. Nabeez or Naqi' water is made by soaking several dates with mineral water in a closed container for 12 hours. This is as narrated by Muslim from Ibn Hazn Al Qusyairi "I met 'Aisyah (r.a) and asked her about Nabeez water. Then she called her servant from the land of Habsyi. Then 'Aisyah (r.a) said, "Ask her, because she is the one who used to make the water for the Prophet Muhammad (s.a.w.)". Then the servant replied, "I used to make the water for him in a closed container of drinking water, then I tied it up and hung it, then he drank it in the morning" (Hadith narrated by Muslim no. 3744) and Bukhari from Abu Hazim, "I heard words of Sahl bin Sa'd As Sa'idi that Abu Usaid As Sa'idi had invited the Prophet (s.a.w.) on his wedding day. While wife of Abu Usaid who served the guests even though she was a bride. His wife said, "Do you know what I have poured for the Prophet Muhammad (s.a.w.)? I poured him the immersion water of dates in a pot" (Hadith narrated by Bukhari No. 5162 and 5168). It is not recommended for Muslims to consume Nabeez water which has undergone fermentation because it will become wine. The term Nabeez is used more often to mention fruit water that has been fermented and has an intoxicating effect ^{25, 26} and the term Naqi' is more often used to mention the immersion water of dates that have not been fermented. Naqi' water which is sweet and cold (because it is left for several hours) is the most preferred drink by the Prophet Muhammad (s.a.w.) as stated by 'Aisyah (r.a), "Indeed the most favored drink by the Prophet Muhammad (s.a.w.) was Al Hulwa Al Barid (sweet and cold)" (Hadith narrated by Tirmidzi No 1817).
Dates with cheese	The messenger of Allah (The Prophet Muhammad s.a.w.) like dates and cheese as narrated in Abu Daud's hadith that two of Busr As Sulami's children said, "Rasulullah s.a.w. met us, then we served cheese and dates, and he liked them both". (Hadith narrated by Abu Daud no. 3340).
Dates, cheese and butter	Bani Sulaim said, "Rasulullah s.a.w. had come and stopped at my father's house, then my father served Hais (food made from a mixture of dates, cheese and butter) to him....." (Hadith narrated by Abu Daud no. 3241) and Ibn Abbas said, "The most preferred food of the Prophet (s.a.w.) was porridge made from bread and from hais (that was a mixture of dates, cheese and butter). Abu Daud said, this is a weak hadith." (Hadith narrated by Abu Daud no. 3289).
Dates with cucumbers	In the Hadith narrated by Abu Daud, from Abdullah bin Ja'far Radhiyallahu 'anhu (r.a.) he said, "The Prophet (s.a.w.) had eaten cucumber with ruthab (fresh dates)" (Hadith narrated Abu Daud no. 3338) and 'Aisyah (r.a) said, "My mother wanted, I looked fat when I met the Prophet (s.a.w.). However, I did not get what she wanted until she (her mother) gave me a meal of cucumber with ruthab (fresh dates). Then I became fat (fresh) with an ideal body shape." (Hadith narrated by Abu Daud no 3404). Another Hadith narrated by Bukhari, from Abdullah bin Ja'far bin Abu Thalib r.a., he said, "I saw the Prophet s.a.w. ate fresh dates with qitsa' (a kind of cucumber)" (Haidth narrated by Bukhari no. 5020). Likewise in the Hadith narrated by Muslims, from Abdullah bin Ja'far. He said, "I have seen the Prophet s.a.w. ate cucumbers with ruthab (fresh mature dates)" (Hadith narrated Muslim no. 3806).
Dates with watermelons	Aisyah (r.a) said, "Rasulullah s.a.w. often ate watermelon mixed with wet dates". A similar hadith was also narrated from Anas that Abu Isa said, "this is hadith of Hasan Gharib" (Hadith narrated Tirmidzi no. 1766).
Dates with pumpkin	'Aisyah (r.a) said, "Rasulullah s.a.w. had eaten pumpkin with fresh dates. Then he said, We eliminate this heat with this cold, and this cold with this heat." (Hadith narrated Abu Daud no. 3339).
Dates with wheat	Yusuf bin Abdullah bin Salam said, "I saw the Prophet s.a.w. took a piece of bread made from wheat and put the dates on it, and he said, this dates is a side dish for this bread" (Hadith narrated Abu Daud no 3334) and Anas bin Malik said, "The Prophet (s.a.w.) celebrated Shafiyah's wedding by cooking wheat with dates" (Hadith narrated Abu Daud 2353).

Table 11. Recommended time to consume dates

Time	Description
When iftar	Anas bin Malik said, "formerly the Prophet s.a.w. broke his fasting with some ruthab (unripe dates) before praying, if not with ruthab then with some tamr, and if there was no tamr then he sipped water several times" (Hadith narrated by Abu Daud no. 2009) and Salman bin 'Amir said, "The Messenger of Allah said, "if one of you is fasting, then he should break the fast with dates, if he has not dates then he can drink water, because indeed water can cleanse (az-zahair and al-bathin, or eliminate thirst)." (Hadith narrated Abu daud no. 2008). Likewise Salman bin 'Amir Ad Dlabbi said, "The Prophet s.a.w. said, "If one of you breaks your fast, then breaks with dates". Ibnu 'Uyainah added, "For indeed the dates have barakah (goodness), if there are no dates, then breaks by drinking water, because water is Thahur (holy is purifying)". Abu 'Isa said, "this is hadith of Hasan saheeh" (Hadith narrated by Tirmidzi no. 631).
When dawn (sahur)	Not only when breaking the fast, the messenger of Allah also encourages Muslims to dawn (sahur) with dates. From Abu Hurairah, the Prophet s.a.w. said, "The best food for sahur for a Muslim is a date" (Hadith narrated Abu Daud no 1998).
Morning	Father of 'Amir bin Sa'd bin Abu Waqqash has told us that The Prophet s.a.w. said, "whoever eats 7 items of Ajwah dates in the morning, then he/she will avoid poison and magic on that day" (Hadith narrated by Bukhari no. 5334 and 5025 and by Abu Daud no. 3378).
Noon	It has been told to us from Ummul Mukminin 'Aisyah (r.a) that "The messenger of Allah (s.a.w.) came to my house and asked, "Do you have lunch?". I replied, "No". Then he said, "I will fast". Further, She ('Aisyah r.a.) said, "one day The Prophet s.a.w. came to me again, then I told him, "we get a gift of food". He asked, "what is that?". I replied, "Hais (ie dates mixed with Samin and 'Aqith)". He said, "Actually, this morning, I intended to fast". Then He ate it. Abu 'Isa said, "This is hadith of Hasan" (Hadith narrated by Tirmidzi no. 666).
During childbirth	An advice for Mariam (Maria), during the birth of Jesus, to eat dates during labor, "shake the date tree trunk towards you: it will make fresh mature dates fall on you" ³⁰ . This is stated in Qur'an, surah Maryam: verses 23-26, "Then the soreness of childbirth process has forced her (Mariam)(leaning) on the base of the date palm tree, she said: "Ouch, it is better for me to die before this, and I will become a meaningless, forgotten thing". Then angel Jibril (Gabriel) called her from a low place: "do not be sad, indeed your God has made a tributary beneath you. And shake the base of the date palm tree towards you, certainly the tree will abort the mature dates, then eat, drink and have fun with those. If you see a human, then say: "indeed I have vowed to fast for the Most Gracious God, so I will not speak to a human being today".

How do Muslims consume dates?

Time	Description
Newborn baby (tahneek)	Muslims are advised to do <i>tahneek</i> to their babies (rubbing a small amount of date into the baby's palate) so the first thing that touches the baby's mouth is something sweet and prays for the baby. Furthermore, the baby is only given breast milk for up to 6 months ^{27, 28, 31} . Abu Musa (r.a.) said, "A child was born to me and I took the baby to the Prophet Muhammad s.a.w., who was later named Ibrahim, then the Prophet did <i>tahneek</i> to the baby with date and prayed to the God for the blessing of the baby, and after that the baby was returned to me" (Hadith narrated by Bukhari no. 5467). The messenger of Allah (s.a.w.) did <i>tahneek</i> to Abdullah bin Zubair (son of Asma' binti Abu Bakar) by using dates. Imam An-Nawawi explained that the law of <i>tahneek</i> , which is carried out with dates, is Sunnah (an advice). Ibnu Hajar Al-Asqalany elucidated that doing <i>tahneek</i> is more preferred with dry dates (<i>Tamr</i>). However, if it is difficult to acquire <i>tamr</i> , then it can be used wet dates (<i>Ruthab</i>). The order of substances that can be used for <i>tahneek</i> , the first is <i>tamr</i> , the second is <i>ruthab</i> ; the third is honey bee; if the honey bee is also not available, then use something sweet that comes from nature and it is not touched by fire. Syaikh Ibnu 'Utsaimin said that <i>tahneek</i> should be given as soon as when the new baby is born so the first thing eaten by the baby is dates or something sweet. Imam Nawawi also stated that the baby, who will be done <i>tahneek</i> , is newborn baby who has not been breastfed by his/her mother ³² . Yet, if it is not possible to do <i>tahneek</i> immediately after birth or the day after, it can also be done a few days after birth, but it is less important. The same thing was expressed by Ibn Hajar "if the baby is born during the day, the recommended time for <i>tahneek</i> is nearing the afternoon" ³³ .
When feeling unhealthy	The messenger of Allah (s.a.w.) recommends Muslims to consume dates when sick as told to us from Sa'd, he said, "when I was sick, the Prophet (s.a.w.) came to see me, then he put his hand between my chest (in the middle of chest) so I felt the coldness of his hand on my chest. Then he said, "surely you are a man who has a disease in your heart, come to Al Harits bin Kaladah (brother of Tsaqif) because he knows about medicine. He should take 7 items of Ajwah dates and comminute the dates together with its pits, then drink it to you!" (Hadith narrated by Abu Daud no 3377).
Before leaving Eid al-Fitr prayer and after Eid al-Adha prayer	Muslims are advised to consume dates before leaving the Eid al-Fitr prayer and after Eid al-Adha prayer as told to us from father of Abdullah bin Buraidah that "the Prophet s.a.w. did not go out (to the place of prayer) on the feast of Eid al-Fitr until he ate first, however he did not eat first on the feast of Eid al-Adha until he prayed" (Hadith narrated by Tirmidhi no. 497) and from Anas bin Malik that "on the feast of Eid, the Messenger of Allah (s.a.w.) did not leave to pray until he ate several dates" (Hadith narrated by Bukhari no. 900 and by Tirmidzi no. 498).

Table 12. The content of dates is viewed from several references

Content	Description
Energy	Dates are the best source of energy ^{19, 39} because they contain high carbohydrates ^{3, 9, 18, 22, 38, 40-43} . The main sugars contained in dates are glucose, fructose and sucrose. In the early stages of maturity, dates contain high sucrose, furthermore, during the maturation process (<i>Khalaal</i> stage), sucrose is converted to glucose and fructose ^{1, 3, 8, 19, 38, 44-46} . Therefore, the dominant sugar found in mature dates is a simple reducing sugar (i.e. glucose and fructose) ^{8, 41, 47-50} which is easily absorbed by the human body ^{3, 38, 44} and is useful to obtain energy for metabolic processes. On the other hand, dates contain less xylose mannose, lactose and lactulose ²² . Dates are classified either based on invertase levels or sugar composition. Invertase enzymes leads to grouping dates into 3 groups, including 1) dates, that are rich in invertase and contain a significant amount of reducing sugar (about 77%), known as soft dates, 2) dates, that contain little invertase and contain 39% reducing sugar and 38% sucrose, is called semi dry/half soft dates, 3) dates without invertase are classified as dried dates but these dates are rich in sucrose (59%) with a little reducing sugar (17%) ⁶ . Classification of dates based on the sugar content, namely 1) dates that are rich in sucrose (40-65%) and containing 10-20% water and 20-40% glucose and fructose; 2) dates that are rich in glucose and fructose (40-75%) and contain relatively fewer sucrose amounts (10-35%); 3) dates contain 10-35% (water), 65-90% (glucose and fructose), and 0-10% (sucrose); 4) dates that contain lots of water (35-65%) and 35-37% (glucose and fructose) and 0% sucrose ² .
Dietary fiber	Dates contain high dietary fiber ^{5, 8, 18, 19, 41, 43, 45} both insoluble dietary fiber and soluble dietary fiber ⁴³ where insoluble dietary fiber is the main fraction of dietary fiber in dates. ¹⁹ In 100 grams of average dates contain 0.84gr soluble dietary fiber, 5.76 gr insoluble dietary fiber and 8 gr total dietary fiber ^{5, 38, 46} .
Antioxidant	Antioxidants are protective cells of the body's cells against the effects of damaging free radicals. The human body has a mechanism to neutralize the oxidative reactions of free radicals by forming an antioxidant substance called 'endogenous antioxidants'. Besides being produced in the body, antioxidants can also come from outside the body called exogenous antioxidants ⁵¹ . Polyphenols are the most antioxidants in our food. The main group of polyphenols are phenolic acids that mainly caffeic acid and flavonoids, the most common found in foods are flavanols (catechins plus proanthocyanidins), anthocyanins and their oxidation products. Polyphenols are reducing agents, and together with other food reducing agents, such as vitamin C, vitamin E and carotenoids, which are called antioxidants, protect the body's tissues against oxidative stress and pathologies related such as cancer, coronary heart disease and inflammation ⁵² . Antioxidant supplementation can improve the detrimental effects of oxidative processes on living organisms. Exogenous antioxidants can come from both chemical and natural ^{42, 53} . However, the synthetic antioxidants such as butylated hydroxytoluene or butylated hydroxyanisole have been reported to increase cancer development in mice ^{54, 55} . Therefore, natural exogenous antioxidants are more recommended than synthetic. The content of antioxidants in fruit depends on the content of phenolic components, vitamins C and E, carotenoids, and flavonoids ^{3, 56} . Dates are fruits that have high antioxidant activity ⁴⁷⁻⁵⁰ . Antioxidants found in dates are carotenoids, ¹⁹ glutathione, poyamines ² and phenolics ^{2, 19} . Phenolics are the main antioxidants in dates. The types of phenolics present in dates are hydroxycinnamates, phenolic acids and flavonoids. ² Some other compounds found in date seed oils include hydroxytyrosol, protocatechuic acid, tyrosol, gallic acid, caffeic acid, p-coumaric acid and oleuropein ^{3, 57} . Myhara reports that phenolic substances, that are generically referred to as tannins, are high at the <i>kimri</i> stage and progressively decrease as mature dates in the <i>tamr</i> stage ⁵⁸ . Each type of date palm contains various amounts of Tannin ⁴¹ . Tannin is a polyphenol compound derived from plants ^{59, 60} which have two different types, namely hydrolysable tannins (polyesters of gallic acid and various individual sugars) and condensed tannins (polymers of flavonoids) although there are other tannins which are a combination of both ⁶⁰ . Flavonoids are a class of secondary metabolites scattered equally in the plant world and included as one of the largest natural phenols. Tannin contained in unripe fruit causes a sense of tart. Tannin has the ability to bind protein ^{59, 61} and protect proteins from the degradation of microbial enzymes and protease enzymes in plants ⁶² . Besides tannin, the fresh dates also contain Anthocyanins (a type of flavonoid, a class of compounds that contain antioxidant properties) ⁶³ . Dates not only contain compounds with potential antioxidant activity but also antimutagenic potential ⁴² .

Content	Description
Protein	Date flesh contains low protein ^{3, 8, 19, 38, 44, 45} but date seed contain high protein compared to the flesh ^{8, 19} . There are 23 types of amino acids in protein of date and some of them are not found in other fruits such as bananas, oranges and apples ¹⁸ . Dates contain high Aspartic acid, Proline, Glycine, Histidine, Valine, Leucine and Arginine, but contain low in Threonine, Serine, Methionine, Isoleucine, Tyrosine, Phenylalanine and Lysine as well as contain very low Alanine ^{22, 6} .
Ash	Dates contain a little ash ^{3, 8, 19, 38, 44, 45} .
Lemak	Date flesh contains a small amount of fat ^{3, 8, 19, 38, 44, 45} but contains high fat in the seeds ⁴⁴ . Flesh and seed of date contain saturated and unsaturated fatty acids. Saturated fatty acids include capric, lauric, myristic, palmitic, stearic, margaric, arachidic, heneicosanoic, behenic and tricosanoic acids. While unsaturated fatty acids in dates include palmitoleic, oleic, linoleic and linolenic acids ⁴ .
Vitamin	The main vitamins contained in dates are vitamin A ^{18, 22, 64} , vitamin C (ascorbic acid) ^{18, 19, 41, 64} and vitamin B-complex ¹⁹ such as vitamin B1 (thiamine) ^{18, 22, 64} , vitamin B2 (riboflavin) ^{18, 22, 64} and vitamin B3 (Niacin or Nicotinic acid) ^{18, 22, 64} .

Table 13. Minerals contained in dates

Group	Description
Major elements	Calcium (Ca) ^{1, 18, 19, 22, 38, 64} . Calcium is an important element of bones, teeth, living cells and tissue fluids and plays a role in blood coagulation and in the activity of some enzyme systems, and it is also needed for transmission nerve impulses and for contractile properties of muscles ⁶⁵ . Calcium works together with Phosphorus and Magnesium to maintain strength and development of bone ^{22, 65} .
	Phosphorus (P) ^{1, 18, 19, 22, 38, 64} . Phosphorus is the second most macromineral in the body after Calcium and the main constituent mineral of bones and teeth that gives strength to tissues. Phosphorus plays an important role in energy metabolism in the formation of sugar-phosphates and adenosine di- and triphosphates ⁶⁵ , absorption and transport of nutrients, acid-base balance, and as part of essential body tissues.
	Kalium (K) or Potassium . Dates are a good source of Kalium ^{1, 18, 22, 38} . Kalium serves to maintain health and to balance the nervous system, keeping the muscles to work properly ²² , and as cell cations as well as is involved in carbohydrate metabolism. Kalium along with sodium, chlorine and bicarbonate ions also plays a very important role, in the regulation of osmotic body fluids and in maintaining acid-base balance ⁶⁵ .
	Natrium (Na) or Sodium . Dates contain low Sodium ^{1, 6, 18, 22, 64} . Most Sodium is found in soft tissues and body fluids. Like Potassium, it is related to acid-base balance and osmotic regulation of body fluids. It is the cation of the head of blood plasma and other extracellular fluids from the body. It also plays a role in the transmission of nerve impulses and in the absorption of sugars and amino acids from the digestive tract ⁶⁵ . The sodium recommendation is not more than 2,400 mg per day. Consumption of sodium too much can increase the risk of heart disease and hypertension ²² .
	Chlorine (Cl) ⁶ . Chlorine is used by our body to form Chloride salts or Natrium Chloride (NaCl) and hydrochloric acid (HCl) in the stomach. Chlorine is associated with Sodium and Potassium in acid-base relationships and osmotic settings. Chlorine is excreted from the body in urine and eliminated from the body along with sodium and potassium, in sweat ⁶⁵ . While the formation of HCl in the stomach plays a role in the absorption of iron and fat emulsions and to kill germs that cause diseases in the stomach and activate pepsinogen to pepsin.
	Magnesium (Mg) ^{1, 18, 19, 22, 38, 64} . Magnesium plays an important role in many biochemical and physiological processes and in the modulation of membrane transporters and in signal transduction. It also serves as a cofactor for many enzymes, is involved in energy and protein metabolism and nucleic acid synthesis ⁶⁶ . It is distributed mainly in bones and intracellular compartments of muscles and soft tissues; and only less than 1% of the body's total magnesium that is located in the blood ⁶⁷ . In physiological conditions, serum magnesium levels are maintained at almost constant values. Magnesium homeostasis depends on the balance between intestinal absorption and renal excretion. Control of the body's magnesium homeostasis is mainly in the renal tubules ⁶⁶ .
Trace elements	Ferrum (Fe) or Iron . Dates contain a small amount of iron ^{18, 19, 22, 64} . Iron is an essential element needed for the production of red blood cells. Red blood cells function to spread nutrients to all body cells ²² . More than 90% of iron in the body is combined with protein where the most important of is hemoglobin. Iron is also present in the blood serum in proteins called transferrin, which is related to the transport of iron from one part of the body to another. Iron has a major role in a number of biochemical reactions, especially in relation to the electron transport chain enzyme (cytochromes) ⁶⁵ .
	Cuprum (Cu) or Copper . Dates contain less Cuprum ^{18, 19, 38, 64} . Cuprum is a vital element for normal functioning of a healthy body because it plays a role in various biological processes in the body such as embryo growth, mitochondrial respiration, iron metabolism and regulation of hemoglobin levels, hepatocytes, nerve function, neurotransmitter biosynthesis and free radical detoxification ⁶⁸ .
	Cobalt (Co) ¹⁸ . Cobalt is a builder of vitamin B12 ⁶⁵ because Cobalt is the central atom in every molecule of vitamin B12 so to acquire enough Cobalt, body should have enough vitamin B12. Cobalt is an important element for erythropoiesis in the human body and as a substitute for manganese in the activation of several enzymes (such as dipeptidase glycylglycine).
	Manganese (Mn) ^{18, 38} . Manganese serves as Manganese functions as many enzyme activators, plays a role in protein synthesis (DNA and RNA) and is involved in the transmission of the central nervous system from neurohormonal control ⁶⁹ .
	Zinc (Zn) ^{18, 38, 64} . Zinc is activators of several enzyme systems and is involved in replication and differentiation of cells, particularly in the metabolism of nucleic acids. Other physiological functions of Zinc are production, storage and secretion of hormone and involved in the immune system and electrolyte balance. Zinc tends to accumulate in bones rather than the liver, which is the main storage organ of many other trace elements. High concentrations of Zinc are found in skin and hair ⁶⁵ . Consumption of 100 grams of dates can provide more than 15% of daily recommendations for zinc ¹⁹ .
	Molybdenum (Mo) ⁶ . Molybdenum is related to the formation and activity of xanthine oxidase enzymes, aldehyde oxidase and sulfite oxidase ⁶⁵ .
	Selenium (Se) . Dates are the best Selenium source ^{19, 22, 38} which play a major antioxidant role ³⁸ . Selenium is an important element for development and repair of cells ²² and protect the cell membrane by preventing free radicals so that it can reduce the risk of cancer and heart and blood vessel disease ³⁸ .
	Fluoride . Dates contain less fluoride ¹⁸ . In the appropriate amount, fluoride has a beneficial effect on dental caries prevention ⁶⁵ . Adequate fluoride intake will produce saliva containing fluoride which can provide topical protection to the teeth.
	Chromium (Cr) ⁶ . Chromium plays a role in glucose tolerance, in lipid synthesis, and in the metabolism of proteins and nucleic acids ⁶⁵ .
	Nickel (Ni) ⁶ . Nickel is component of cofactor or structural in metalloenzymes and plays a role in the metabolism of nucleic acids. Nickel is an element that is relatively non-toxic, less absorbed from the digestive tract and usually does not cause serious health hazards ⁶⁵ .
Boron (B) . Dates also contain a small amount of Boron ¹⁸ . Boron is classified as 'trace mineral' which is only needed in small quantities by the body. It helps maintain healthy bones and joints and regulates calcium metabolism that allows the body to maintain calcium in the normal range.	

How do Muslims consume dates?

Table 14. Health producing benefits of date consumption

Benefit	Description
Diet	Even though dates contain low protein and fat compared to other dried fruits, dates contain high carbohydrates and energy that is needed for diet. Therefore, dates provide a significant contribution to diet success. Reducing sugars like glucose are sugars that are easily absorbed by the body during food digestion and rapidly increase blood sugar levels and fructose is a sugar that is twice as sweet as glucose. Fructose induces a feeling of satiety so that it can reduce total calorie intake compare to fat-rich foods ¹⁹ .
Immunity	<i>Tahneek</i> with dates will increase the presence of good bacteria in the digestive tract of neonate which is useful to help the growth and differentiation of epithelial cells, strengthen the mucous membranes covered its channel, support the maturity and development of the immune system, inhibit pathogenic bacteria and promote beneficial relationships, assimilation of nutrients particularly carcinogenic substances, and inhibit cancer ⁷⁰ . In addition, there is an alleged relationship between giving dates to newborns (<i>tahneek</i>) and decreased incidence of hypoglycemia in infants. Each baby is at risk of developing hypoglycemia since the glucose production in infants is not perfect yet ²⁸ . Prolonged hypoglycemia can cause permanent neurological disorders and death. Hence, health providers must consider the impact of long-term risks and the appropriate intervention ⁷¹ . Although this is considered to be contrary to the recommendations of exclusive breastfeeding by UNICEF and WHO. In fact, commonly the breast milk will release on the third day after birth and many people give pralacteal foods to their babies. But for Muslims, the implementation of <i>tahneek</i> as exemplified by the Messenger of Allah (s.a.w.) is the best action and is believed to have a good impact on the health of the baby ²⁸ .
Antibacterial	Dates also have been scientifically proven to have an antibacterial effect directly on pathogenic bacteria that can cause serious illness in humans, such as <i>Bacillus Subtilis</i> , <i>Staphylococcus Aureus</i> , <i>Salmonella Typhi</i> , <i>Pseudomonas Aeruginosa</i> ^{72, 73} , <i>Escherichia Coli</i> , <i>Salmonella Enterica</i> , <i>Listeria Monocytogenes</i> , and <i>Staphylococcus Saprophyticus</i> ⁷³ .
Blood	The iron contained in dates is an essential element for the production of red blood cells ²² . Consumption of dates is good for blood health and avoids lead induced haematotoxicity ⁷⁴ . Several experimental studies reported the effect of dietary fiber intake in prevention and treatment of atherosclerosis ^{42, 75} . Some studies also reported that the effects of dates on increasing haemagglutinating antibody titers, plaque-forming cell counts in spleen, and macrophage migration index as an index of cell-mediated immunity ^{3, 42} .
Anemia and constipation	If iron tablets rely on iron content for increased hemoglobin levels, in contrast to dates that use multiple micronutrients to increase hemoglobin levels since other micronutrient deficiencies will limit the hemoglobin response to iron supplements ⁷⁶ . There are some substances in dates that contribute to increasing hemoglobin levels including iron, vitamin A, vitamin C, zinc, and riboflavin ^{7, 18} . Iron tablet consumption commonly causes side-effects in the form of gastrointestinal problems. Otherwise, the consumption of dates can actually overcome gastrointestinal complaints ^{18, 77} . Dates can be a supplement substitute or companion iron tablets for prevention and treatment of anemia ⁷⁷ .
Diabetes	Dates have long been used for prevention and treatment of diabetes ^{2, 75, 78, 79} . Combinations of vitamin A and B-complex vitamins (Vitamin B1, B2, and Nicotinic acid) contained in dates can help maintain blood sugar stability ²² . This finding is supported by the study of Alkaabi et al. that dates are safe for consumption by type II diabetic patients in a balanced amount ²³ . This is because phenolics, which is the main antioxidant in dates ² , is able to inhibit the activity of α -glucosidase and α -amylase to increase blood glucose levels in type II diabetes ⁸⁰ . Experiments carried out in diabetic rats, a chronic treatment of diabetic neuropathy for 6 weeks found that date extracts were able to neutralize activity disorders, restore any reduction in nerve diameter in diabetic patients and protect peripheral nerve damage as the dates contains antioxidants that are the most important components in neuron protection. Consequently, dates can be used to prevent potential for peripheral diabetic neuropathy ⁸¹ .
Heart disease	Dates are safe and well consumed by people with heart disease because they contain low levels of fatty acids and cholesterol ²² . Some studies shown that dates have contributed in the prevention and treatment of degenerative diseases such as heart disease ^{2, 79} . The finding are reinforced by other study that regular consumption of dates showed a very low incidence of cancer and heart disease ²² .
Hypertension	Dates have been used for the treatment of hypertension ⁷⁸ . This is because dates contain high Potassium ^{1, 19} and low Sodium ^{1, 19, 22} , fat and cholesterol so it is highly recommended for hypertension patients ²² . By reducing the case of hypertension is the same as helping to reduce the incidence of stroke and heart disease ^{79, 82} .
Gastric ulcer	Dates contain pre-antibiotics which act as food for pro-biotics (normal digestive flora). One of the pre-biotic examples found in dates is polysaccharides. Consumption of dates can improve intestinal health by increasing the growth of beneficial bacteria. Thus, it is advisable to consume dates early in human life (newborns) to help maintain intestinal health ⁸³ . In addition, like colostrum and breast milk, dates also contain laxatives. The laxative is useful for cleaning unused substances from the intestines of newborn babies and preparing the baby's digestive tract for nutrients that will be received next. Laxative content in dates has been proven by measuring the effects of gastrointestinal transit in rats. Animals that received date extracts had a faster digestion channel compared to the control group, ranging from 4-22% ⁸⁴ . Other study also found that dates extracts and date seeds were effective in mitigating the severity of gastric ulceration, reducing ethanol increase on histamine and gastrin concentrations, and ameliorating mucin gastric levels ⁸⁵ .
Infection	Dates are listed on traditional medicines for the treatment of various infectious diseases ^{42, 75} . This is because dates contain antioxidants, that can protect body tissues from oxidative stress and pathologies related such as inflammation ⁵² . Phenolics from dates also can suppress hypersensitivity immune responses due to the activity of anti-allergic immunomodulators. Immunomodulatory activity of phenolics also includes an anti-inflammatory response triggered by the suppression of the proinflammatory pathway ⁸⁶ .
Cancer	Dates are the best source of antioxidants ^{19, 47-50, 63} and Selenium ^{19, 22, 38} . Consumption of antioxidant-rich foods has an important role in the prevention and treatment of cancer ^{42, 87} because antioxidants can protect body tissues against oxidative stress and pathologies related such as cancer ⁵² and inhibit the proliferation of colon cancer cells and reduce the development of colorectal cancer ⁸³ . An experiments in mice to check the effect of quercetin (flavonoids contained in dates) on the growth of malignant cells from the human digestive tract has found that the growth of gastric cancer cells was markedly inhibited by quercetin. Quercetin can also suppress the synthesis of 14% Deoxyribo Nucleic Acid (DNA) and also inhibit cell development from G1 to S phase ⁸⁸ . In addition, increased selenium intake can reduce the risk of breast cancer, colon cancer, lung cancer and prostate cancer and maintain tissue elasticity ^{89, 90} . Hence, regular consumption of dates showed a very low incidence of cancer ²² .

CONCLUSION

There are several differences between Muslims' habits and Islamic's recommendations in consuming dates. The benefits of recommendation of date consumption as exemplified by the Messenger of Allah (s.a.w.) have been proven by many studies. Muslims need to adopt the Islamic recommendations of date consumption in order to obtain the optimum effects of date consumption since this will not only fulfill the spiritual need but also nutritional needs required by the human body.

Abbreviations: R.a.: Radhiyallahu 'anhu (man)/'anha (woman); s.a.w.: Shallallahu 'alaihi wa sallam.

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