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## The Effect of Eating Even or Odd Number of Dates, on Blood Glucose Level

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### ABSTRACT

**Objectives:** There is a common belief among Muslims, to consume dates in odd number rather than even, based on cultural and religious claims; although nobody knows its effect on blood glucose level or other metabolic effects in the body.

The aim of our study is to illuminate the changes that affect the 2-hrs postprandial serum glucose level after the consumption of an odd number of dates among healthy young persons and even number.

**Method:** Intervention study was used to compare 2 groups, Fasting glucose levels was measured for all participants; group A (42 participants), who consumed even number of dates all at Tamer-stage, (net weight about 50 grams); and group B, (42 participants), presumed to consume an odd number of dates (net weight about 40 grams). Two hrs postprandial blood glucose levels were measured altogether. Blood glucose levels were determined and compared as a means. Statistical analyses were performed using SPSS version 22.

**Result:** The fasting serum glucose of group A and B participants were  $91.65 \pm 13.61$  and  $93.69 \pm 8.79$  mg/dl, respectively, with an insignificant statistical difference between groups ( $P=0.42327$ ). Subsequently, the 2hrs Postprandial Glucose measurements of group A and B were  $99.58 \pm 19.56$  and  $100.33 \pm 12.204$  respectively; indicated an insignificant statistical difference between groups, ( $P=0.83553$ ). All the participants were remaining within normal ranges of serum glucose level.

**Conclusion:** There is no difference between ingestion of the odd and even number of dates fleshes from the glycemic point of view on the glucose level in fasting and postprandial states.

**Key words:** Eating dates, Odd, Even, Glucose level.

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### Introduction

There is a common belief among Muslims, to consume dates in odd number rather than even, based on cultural and religious claims. The changes that affect the 2-hrs postprandial serum glucose level after the consumption of odd or even numbers of dates among healthy

young persons were studied; and showed no difference between ingestion of the odd and even number of dates fleshes from the metabolic point of view on the glucose level in fasting and postprandial states.

## **Background**

The date is one of the ancient plants, eldest diet with high energy producing value; it is widely cultivated and adopted in various tropical and subtropical countries worldwide (Tengberg, 2012).

Each date flesh consists of about 60-65% carbohydrates, 2.5% fiber, 2% protein, >2% fat, minerals, and about 15-30% water according to the stage of ripeness and the variety of dates. Additionally, date can provide more than 3000 Calories/kg (Al-Shahib *et al.*, 2003), that's mean the consumption of 100 g dates daily (six to seven dates) can provide the human body with a wide variety of vitamins, salts, minerals and provided 50%-100% of the recommended daily intake of fiber (Al-Shahib *et al.*, 2002). These facts make dates as a most nourishing natural food and best food for consumption by all ages of the population all over the world (Al-Shahib *et al.*, 2003, Zaid *et al.*).

Even though, some researches, found that the glycemic index (GI) of dates is low and its consumption does not cause a significant shot in the post-prandial blood glucose level, with glycemic indices (GIs) range (35.5-47.2) putting the dates in the list of the low GI food items (Miller *et al.*, 2002, Alkaabi *et al.*, 2011). Deserve to be one of the fruits which are widely consumed worldwide, particularly in the Arab and Islamic regions and it is one of the few numbers of foods that are directly mentioned in the Holly Qur'an (Touzani *et al.*, 2008).

However, there is a common belief among Muslims, most of them, they advised to consume dates in odd number rather than even (Mahmoodi *et al.*, 2012), although, nobody knows the effect of date number on blood glucose level or other metabolic effects in the body, as well as there was no previous scientific research spot the light on this subject. For these reasons, we try in this study to determine effect of the date number on blood glucose levels.

The aim of our study is to illuminate the changes that affect the 2-hrs. Postprandial Serum Glucose (2hs.PPSG) level after the consumption of odd and even numbers of deaths among healthy younger persons with normal Fasting Serum Glucose (FSG) level and their related variables.

## **Materials and Methods**

### **Study design**

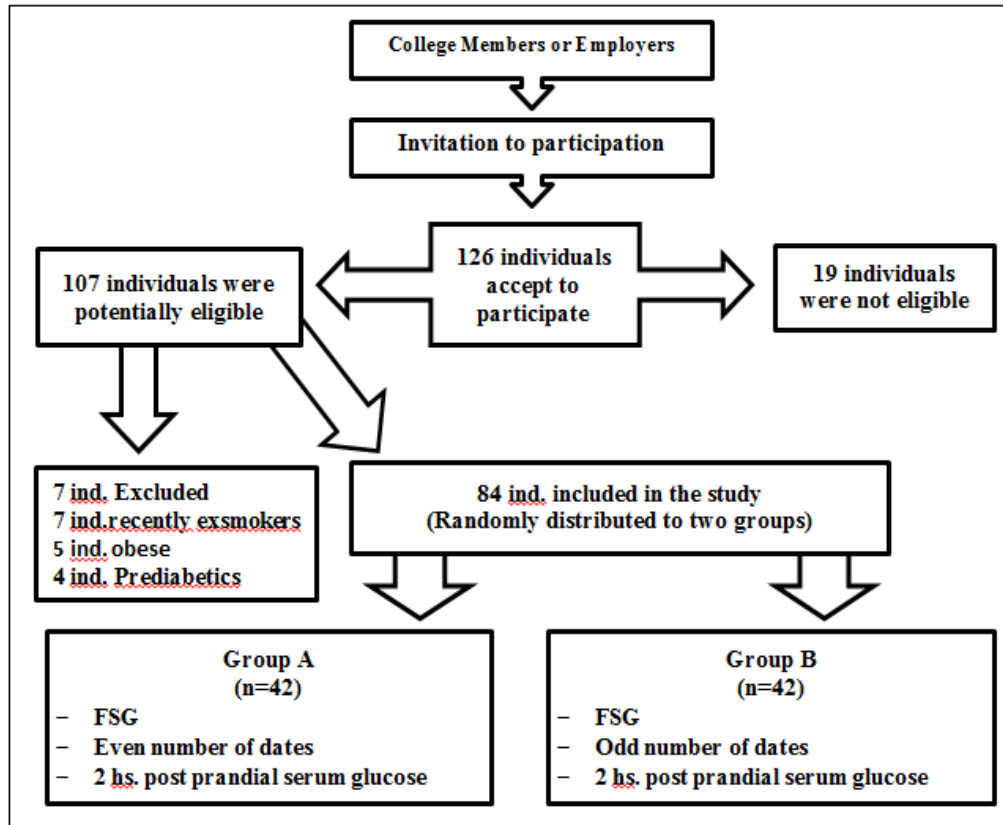
Intervention study was used to compare the glucose levels before and after ingestion of odd and even pattern of dates among two matched study groups.

### **Sample recruitments**

Participants were recruited from the College members, employees and students of the Chemical Engineering Department/College of Engineering/Baghdad University, who were informed to participate through invitation posters. The data collection extended from the 1st November to the 1st December 2017.

### Flow chart of the study

An 84 participants were completely eligible (42males and 42 females) fit for the inclusion criterion and were recruited for simple randomization to divide them into two groups (no blinding was used); group A (42 participants, 21 male and 21 female), who would consume even number of dates (net weight about 50 grams); and group B, (42 participants, 21 male and 21 female), presumed to consume an odd number of dates (net weight about 40 grams) (Figure 1).



**Figure 1.** Flowchart of study

### Study protocol

All the participants were asked to have overnight fasting and to stay fasting until they attend to the college at 7.30-8.30 AM. A sample of blood was taken from each one for measurement of FSG level, and then everyone asked to eat 4 or 5 fleshes of dates according to their groups. All flesh of dates was of the same type, at Tamer-stage, each flesh had an average weight of 9.25-10.10 grams. Participants ingest the dates followed by a glass of water (100 mL) and to stay on this regimen without additional foods or drinks, till the 2hs.PPSG levels were measured. Upon the end of the trial, the subjects would become free to join their daily activity.

Samples of blood were collected from all participants to be examined later, in the National Diabetes Center (NDC)/Al-Mustansiriyah University laboratory, for the investigation of FSG and 2hs.PPSG levels; KENZA 240TX auto analyzer was used for this purpose.

**The inclusion criteria;** were non-smokers, healthy persons (no diabetes, no chronic disease, nor other co-morbidities even the metabolic problems), males and females of age ranging between 18-50 years.

**The exclusion criteria;** were the obesity and morbid obesity (BMI > 35 kg/m<sup>2</sup>) or a history of previous obesity, pre-diabetes (fasting blood sugar  $\geq$  100 gm/dl) (9), alcoholic persons, pregnant women.

### Ethical approval

Consents for participation in the study were obtained according to the Helsinki II Declaration (10), after a briefing about the project; and approved by the ethics committee and the scientific research committee at the National Diabetes Center and the College of Medicine/Al-Mustansiriyah University. The demographic data, family and past medical history of participants were recorded also; physical examination of pulse rate, blood pressure and anthropometric measurements of weight, height as well as BMI was measured for all participants.

### Statistical analysis

All obtained data and records were managed by SPSS, version: 22, for statistical analysis. The Anderson-Darling test was done to prove normal distribution of the obtained data, student t-test was used for the comparison of two means, and chi square test was used to compare non numerical discrete data.

### Results and Discussion

Age, gender distribution of group A and B and their BMI values, revealed insignificant statistical differences ( $P=0.48771$ ,  $0.01792$ ,  $0.801$  respectively). This mostly due to the cautious manner of choosing samples, and randomization in group recruitment rendered them equivalent and comparable (Table 1).

Family history of diabetes mellitus among study participants showed statistical significant difference between groups ( $P=0.00072$ ). This expected figure may be because diabetes is a common disorder in Iraq and all over the world (11, 12) (Table 1).

**Table 1.** Characteristics of study groups participants

		Group A (EVEN) n=41	Group B (ODD) n=42	Sig. (P value)	Notes
Age		30.41±11.68	28.64±11.46	0.4877	Student t-test, not significant ( $P \geq 0.05$ )
BMI		24.22±4.79	24.51±5.54	0.801	
Gender	Male	21	21	0.0179	Chi square test, not significant ( $P \geq 0.05$ )
	Female	21	21		
Family history of diabetes mellitus	Yes	9	20	0.0007	Chi square test, Significant ( $P \leq 0.005$ )
	No	32	22		

The mean of Measurements of the Fasting Serum Glucose (FSG) of group A and B participants' were  $91.65 \pm 13.61$  and  $93.69 \pm 8.79$  mg/dl, respectively, with insignificant statistical difference between groups ( $P=0.42327$ ); indicates no any pre diabetic was detected among the participants according to the diagnostic criteria (13). This healthy metabolic state of respondents, often owing to the high commitment to the study protocol during sample selection (Table 2).

Participants ingested the dates in an odd or even number of fleshes according to their groups. Dates ingested contain about the same amount of glucose used in oral glucose tolerance test, which is a more definitive test that have no serious risks and give important clues about health; in addition an Oral Glucose Tolerance Test (OGTT) shows how well your body handles sugar from foods (14, 15, 16). Subsequently, after ingestion of dates, the means of 2 hours PPSG measurements of group A and B were  $99.58 \pm 19.56$  and  $100.33 \pm 12.20$  respectively, with insignificant statistical difference between groups, ( $P=0.83553$ ), the higher figure of PPSG found in group B (odd group) may be attributed to the (extra one date) given to this group that might cause trifling personal differences. However, these changes did not manifest itself statistically. Moreover, the Changes of the glucose level for each participant among group A and B before and after ingestion of the dates seem to be insignificantly different ( $P=0.62089$ ). Furthermore, all the participants were remaining within normal ranges of serum glucose levels, despite 34.5% of them were found to be with positive family history but they showed no glycemic response to date ingestion. This may be because the vast majority of this sample was young and below the risk of development, such health problem (17).

Obviously this indicates the negligible and a trivial effect of ingestion of dates in odd or even manner on the glucose metabolic state with no statistical meaning (Table 2).

**Table 2.** Characteristics of study groups participants, according to blood glucose measurement

	<b>Group A (EVEN) n=42</b>	<b>Group B (ODD) n=42</b>	<b>Sig. (P value)</b>	<b>Notes</b>
FSG	$91.65 \pm 13.61$	$93.69 \pm 8.79$	0.4232	Student t-test, not significant ( $P \geq 0.05$ )
2 hs. PPSG	$99.58 \pm 19.56$	$100.33 \pm 12.20$	0.8355	
Change of glu. level	$9.95 \pm 21.19$	$7.97 \pm 14.49$	0.6208	

Although there is no obvious indication to ingest dates in any manner in Islamic references, but still there is habitual concept designed or formatted on religious bases solidified through multiple eras to become virtually a traditional norm. Because it ignores the size, weight, dryness and serving form of the dates which seriously affect its chemical components specially the carbohydrate, the glycemic index and glycemic load of any ingested food.

## Conclusion

There is no difference between ingestion of odd or even number of date fleshes from the glycemic point of view on the glucose level in fasting and postprandial states.

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