

Nutritional Security of Date Palm Fruit: An Empirical Analysis for Al-Ahsa Region in Saudi Arabia

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ABSTRACT

Date palm (*Phoenix dactylifera L.*) is consumed since the ancient era in the Arab region, particularly in Saudi Arabia. This study aims to assess the consumption of dates, its association with obesity in addition to estimate the nutrient indices of consumed dates among Saudi population in Al Ahsa region. Household Saudi males and females (n=477) were involved in this study. They were classified into three groups; children (n=46), Adolescents (n=72) and Adults (n=359). Data on anthropometric measurements, socioeconomic factors, and consumption of dates were collected from the respondents. Some nutrients of dates were analyzed to calculate the indices of energy, carbohydrates, non-starch polysaccharides (NSPs) in addition to determine some minerals and vitamin contents. The obtained results indicated that adolescents followed by adults consumed the highest amount of dates. The results also revealed that the consumed dates could secure about fourth of the recommended daily requirement of potassium and the fifth of both magnesium and NSPs. Moreover, the study found that obese persons dates consumption was the highest in comparison to underweight and normal weigh respondents ($p < 0.05$), however; the correlation between dates consumption and body mass index (BMI) was low. The study confirmed the importance of daily consumption of dates in securing some minerals and indicated that dates consumption is not responsible for weight gaining.

Key Words: Anthropometric measurements, Body mass index, Date palm consumption, Nutrient index

INTRODUCTION

Date palm (*Phoenix dactylifera L.*) is one of the major fruit crops in arid and semiarid regions (Manickavasagan *et al.*, 2012). The major date producers in the world are located in the Middle East. Based on Al-Abbad *et al.* (2011), the Arab world possesses more than 84 million date palm trees. According to inheritance, religious, environmental and traditional factors, Saudi Arabia is a main region of growing this crop with more than 28 million date palm trees producing over 1.2 million metric tons (mt) annually (General Authority for Statistics, 2015). El-Eid *et al.* (2015) mentioned that Saudi Arabia was ranked as the second country in the world in term of quantities of dates production. In addition, Saudi occupies the first rank in the world in terms of average per capita consumption of dates, which reached about 34.8 kg per year in 2003 (Al-Eid *et al.*, 2015).

It has reported that a typical adult Saudi may consume between 20 and 120 g of dates at one sitting (Al-Mssallem and Brown, 2013). Recently, there is a fluctuation in date's consumption among Saudi populations due to major changes in dietary habit and availability of other fresh fruits and sweets (Al-Mssallem, 2014; Al-Eid *et al.*, 2015). Date palm fruit is distinguished by high nutritious value which gives it special consideration as a contributor to nutrition security (Al-Shahib and Marshall, 2003; Al-Farsi and Lee, 2008; Baliga *et al.*, 2011). The major chemical constituents of dates are the simple carbohydrates in the form of glucose and fructose, making it an excellent source of instant energy (Al-Shahib and Marshall, 2003; Al-Farsi and Lee, 2008; El-Sohaimy and Hafez, 2010; Ahmed *et al.*, 2013; Tang *et al.*, 2013). In addition, date palm fruit is rich in non-starch polysaccharides (NSPs) and some

minerals such as potassium and magnesium (Al-Farsi and Lee, 2008; Shabani *et al.*, 2016). As mentioned above, carbohydrates are the predominant component in date palm fruits which reach up to 70-80 %, while protein and fat occur in small amounts with an average of 1.5-2.1 % and 0.14-0.38 % respectively (Al-Hooti *et al.*, 1997; Al-Farsi *et al.*, 2007; El-Sohaimy and Hafez, 2010). It is evident that dates represent an important nutritional element in the daily intake of Saudi populations (El Hadrami and Al-Khayri, 2012). Moreover, date palm fruits provide unique functional and nutritional values. The functional properties of dates attribute to their contents of dietary NSPs and antioxidants. It is evident that dates as a functional food provide health benefits besides nutrition (Al-Farsi and Lee, 2008; Al-Farsi *et al.*, 2008; Vayalil, 2013). The presence of dietary NSPs in considerable amounts in the dates can play a role in controlling food intake and thus losing weight (Kristensen and Jensen, 2011). Many researches focused on different aspects of palm date chemical composition of (Al-Hooti *et al.*, 1997; Al-Shahib and Marshall, 2003; AlFarsi *et al.*, 2007; El-Sohaimy and Hafez, 2010; Ahmed *et al.*, 2013; Tang *et al.*, 2013). Other researchers focused on production (Al-Shreed *et al.*, 2012; Al-Abbad *et al.*, 2011; El-Juhany, 2010; Ministry of Agriculture, 2006) or fruit characteristic (Al-Asmari *et al.*, 2017; Al-Abdoulhadi *et al.*, 2011; Rahman, 2013). The justification of this research is related to the steady increase in Saudi populations, which led to the increase in date palm consumption. It is believed that the frequent consumption of dates is associated with gaining weight and some chronic diseases. The general objective of the present research is to investigate the importance of date palm in securing nutrition status and estimate the date nutrients indices for Saudi populations in the Al-Ahsa region. Whereas the specific objectives were: 1) to analyze some quantitative characters of the target groups in term of age, weight, high and body mass index (BMI); 2) to estimate nutrient indices for different gender and age

groups in the study area; and 3) to calculate the actual and recommended intakes of the most important nutrients contents of consumed dates.

MATERIALS AND METHODS

Al-Ahsa region in the Eastern Province of Saudi Arabia was selected as the case in the study area. Data collection forms were distributed among Saudi households including males and females of different age groups. Within the randomly selected households, the number of children, adolescents, and Adults were 46, 72 and 359, respectively. Data on anthropometric measurements, socioeconomic factors, and consumption of dates were collected from the respondents using data collection form (From September 2016 to January 2017). The nutrients of dates were analyzed and the indices of energy, carbohydrates, non-starch polysaccharide (NSP), and some minerals and vitamin were estimated.

The data was analyzed by using simple descriptive analysis and the results were expressed as a number (n), percentage (%) and means \pm one standard error of the mean (SE).

The nutrient indices were analyzed by applying simple equations, which were illustrated as follow:

1. Calorie contents index formula

$$CI = (ACC / ARC) * 100 \dots\dots\dots (1);$$

whereas CI = calorie index, ACC = average calorie content, ARC = average recommended calorie

2. Carbohydrates contents index formula

$$CHOI = (AHCOC/ARCHO)*100 \dots (2);$$

whereas CHOI = carbohydrate index, AHCOC = average carbohydrate content, ARCHO = average recommended carbohydrate

3. Non-starch polysaccharides index formula

$$NSPsI = (ANSPsC/ARNSPs) * 100 \dots\dots (3);$$

where as NSPsI = non-starch polysaccharides index, ANSPsC = average non-starch polysaccharides content, ARNSPs = average recommended non-starch polysaccharides

4. Potassium index formula

$KI = (AKC / ARK) * 100$ (4);
 whereas KI = potassium index, AKC = average potassium content, ARK = average recommended potassium

5. Magnesium index formula
 $MgI = (AMgC / ARMg) * 100$ (5);
 where as MgI = magnesium index, AMgC = average magnesium content, ARMg = average recommended magnesium

6. Iron index formula
 $FeI = (AFcC / ARFe) * 100$ (6);
 where as FeI = iron index, AMgC = average magnesium content, ARMg = average recommended magnesium

7. Vitamin C index formula
 $VCI = (AVCC / ARVC) * 100$ (7);

whereas VCI = vitamin C index, AVCC = average vitamin C content, ARVC = average recommended vitamin C.

Furthermore, the analysis of variance was accomplished using F- test analysis for differences in consumption of dates and nutrient indices between all age groups.

RESULTS AND DISCUSSION

Respondents’ characteristics are displayed in Table1. In general, respondents had an average age of 28 years and the BMI of a majority of them (47.8%) fell in the normal weight category (BMI< 25). However, the underweight respondents were only 7.5%, who were significantly younger than the other groups (F=24.7, p<0.001).

Table1. General characteristics of respondents

Items	Children (n=46) mean ± SE	Adolescents (n=72) mean ± SE	Adults (n=359) mean ± SE	Total (n=477) mean ± SE
Age (year)	5.8 ± 0.38	13.5 ± 0.25	33.9 ± 0.70	28.1 ± 0.70
Weight (kg)	20.8 ± 1.23	45.1 ± 1.59	69.8 ± 0.93	61.3 ± 1.04
Height (m)	102.9 ± 3.82	145.6 ± 2.05	163.7 ± 0.47	155.1 ± 1.02
BMI (kg/m ²)	21.1 ± 1.69	21.7 ± 0.93	25.9 ± 0.31	24.8 ± 0.33

It is obvious from figure 1 that the obese groups consumed more quantity of dates in

comparing by the others groups concluded in the study.

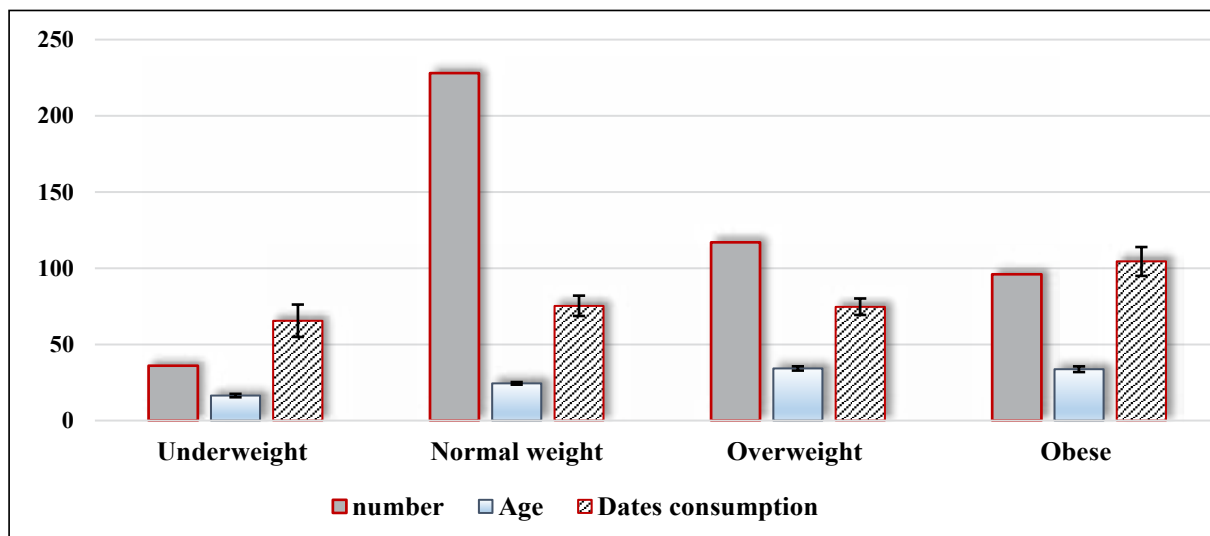


Figure 1. The numbers (n), age (y) and date consumption (g/day) of respondents based on their BMI category (n=477)

From Table 2, the highest consumption of

dates (g/day) was by adolescents (90.1 ±

15.35) followed by adults (83.6 ± 4.33) and then children (38.8 ± 4.13). This is an unexpected result which can be attributed to the modification in the dates consumption pattern that has recently occurred. Furthermore, it can be explained due to the increase of nutritional awareness among young people towards the health benefits of dates. Additionally, the high consumption of dates by adolescents could be affected by the lower number of surveyed adolescents (72) with high SE compared to adults (359) as indicated by the randomly selected households.

There was a positive highly significant correlation between the consumption of dates and age as observed in the study results. Furthermore, the results showed that when an increase in age by 1 year consequently there was an increase in consumption of dates by 0.84 g. This result was observed when the age ranged about 6-33 years. Similarly, it has been found that the consumption of dates was higher by older people (30-60 year) than younger ages within the United Arab Emirates (UAE) populations (Ismail *et al.*, 2006). In this study, the weighted average of dates consumption for the 3 age groups was 80 g/day. It was reported that a typical adult Saudi may consume between 20 and 120 g of dates at one sitting (Al-Mssallem and Brown, 2013). However, it was mentioned that the average per capita consumption of

Saudi dates reached about 95 g/day (Al-Eid *et al.*, 2015). In comparison, Ismail *et al.* (2006) found that the daily date consumption by UAE citizens reached 114 g. Later on, Qazaq and Al Adeeb (2010) reported that the average consumption of date in the UAE was 72 g/day. The difference in the number of consumed dates between our findings and other studies could be explained by the fact that this study estimated only the dates consumed as a whole whether as fresh or dried. However, the previous studies have taken into account dates consumed as fresh or dried as well as derived date products and dates-based-foods (Al-Eid, 2004; Al-Eid *et al.*, 2015).

The study results showed that the consumption of dates by obese respondents was the highest in comparison with underweight and normal weight respondents ($p < 0.05$). However, the association between the dates consumption and BMI was low ($r = 0.16$, $p < 0.01$). This indicates that that consumption of dates would not be responsible for gaining weight. It is a fact that dates are the main source of readily absorbable sugar such as glucose and fructose but are also rich in non-starch polysaccharides (NSPs). The NSPs in dates play an important role in increasing satiety, which has shown to be associated with decreasing body weight (Kristensen and Jensen, 2011).

Table 2. The consumption of dates and nutrient indices for target groups

Items	Children (n=46) mean \pm SE	Adolescents (n=72) mean \pm SE	Adults (n=359) mean \pm SE	Total (n=477) mean \pm SE
Consumption of dates (g)	38.8 ± 4.13	90.1 ± 15.35	83.6 ± 4.33	80.3 ± 4.05
Energy index (%)	6.1 ± 0.64	11.6 ± 2.14	9.6 ± 0.52	9.6 ± 0.51
Carbohydrates index (%)	8.6 ± 0.90	16.3 ± 3.01	13.5 ± 0.72	13.4 ± 0.72
Non-starch polysaccharides index (%)	12.8 ± 1.32	23.09 ± 4.00	20.16 ± 1.09	19.8 ± 1.03
Iron index (%)	4.8 ± 0.52	4.2 ± 0.79	4.2 ± 0.23	4.3 ± 0.21
Potassium index (%)	16.7 ± 1.78	28.8 ± 5.28	25.0 ± 1.28	25.8 ± 2.79
Magnesium index (%)	25.8 ± 2.79	21.4 ± 3.93	19.0 ± 1.05	20.07 ± 1.00
Vitamin C index (%)	3.3 ± 0.31	6.2 ± 1.14	4.7 ± 0.24	4.8 ± 0.25

The study results argue that the dates consumption can secure in average 9% and 13% of energy and carbohydrates; respectively. It has been emphasized that dates are considered as a high source of energy due to the presence of readily digested and absorbed carbohydrates, mainly glucose and fructose (Al-Farsi and Lee, 2008). The presence of these natural sugars can provide instant energy for the body. Therefore, dates are traditionally served to break the fast during Ramadhan. This study also found that dates consumption can secure about 19% of non-starch polysaccharides (NSPs). It was about double what dates can secure for energy requirement. This indicates the importance of dates as a source of NSPs as well (Al-Shahib and Marshall, 2003). The major fraction of NSPs in dates is insoluble NSPs (Elleuch *et al.*, 2008). Insoluble NSPs have several health benefits, which include increasing satiety and decreasing appetite (Kumar *et al.*, 2012). It is well known that increasing satiety promotes control of energy intake and reduces the risk of developing obesity (Kristensen and Jensen, 2011). Dates also have an effect in regulating intestinal transit by promoting regular bowel movements, thus it can be used as natural laxatives (Manickavasagan *et al.*, 2012; Al-Farsi and Lee, 2008). Furthermore, the study stated that potassium index was the highest nutrient index followed by magnesium index where consumed dates can secure about 25.8% and 20% of the recommended daily allowance, respectively. The lowest nutrient index was the iron index, with an average value of 4.3% of the recommended daily allowance followed by vitamin C index with a value of 4.8% (Table 2). It has been reported that consuming 100 g of dates can provide above 15% of the recommended daily allowance from the potassium and magnesium (Al-Farsi and Lee, 2008). Potassium plays a crucial role in protecting against strokes and coronary heart diseases through regulating heart rate and blood pressure (Haddy *et al.*, 2006). Potassium also is important in balancing

the body's nervous system and fluids. Magnesium is also required as a cofactor for several biochemical reactions in the body (Pamnani *et al.*, 2003).

In conclusion, date consumption is common in Saudi Arabia at different ages. Many people believed that date is associated with some chronic diseases due to its high simple carbohydrate contents. This study concluded that date consumption increased in adolescents due to increased awareness of its nutritional benefits. Interestingly, the association between dates consumption and weight gain was neglectable. This indicated that the consumption of dates is not responsible for gaining weight. Further researches, particularly long-term studies, may be required to determine the association between date consumption and some hereditary diseases like diabetes and blood pressure. Moreover, the study may contribute in monitoring one aspect of food security in Saudi Arabia at individual and household levels, and developing informative database for relevant research and executive sectors. Further research in this field is highly recommended.

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REFERENCES

- Ahmed, J., Al Jasass, F.M., and Siddiq, M. 2013. Date fruit composition and nutrition. *In: Siddiq, M., Aleid, S.M., and Kader, A.A. (Eds.) Dates: Postharvest Science, Processing Technology, and Health Benefits.* pp. 261-283. John Wiley and Sons, Ltd, UK.
- Al-Abbad A., Al-Jamal, M., Al-Elaiw, Z., Al-Shreed, F., and Belaifa, H. 2011. A study on the economic feasibility of date palm cultivation in the Al- Hassa oasis of Saudi Arabia. *Journal of Development and Agricultural Economics.* 3 (9): 463-468.

- Al-Abdoulhadi, I. A., Al-Ali, S., Khurshid, K., Al-Shryda, F., Al-Jabr, A. M., and Ben Abdallah, A. 2011. Assessing fruit characteristics to standardize quality norms in date cultivars of Saudi Arabia. *Indian Journal of Science and Technology*. 4 (10): 0974- 6846.
- Al-Asmari, F., Nirmal, N., Chaliha, M., Williams, D., Mereddy, R., Shelat, K., and Sultanbawa, Y. 2017. Physico-chemical characteristics and fungal profile of four Saudi fresh date (*Phoenix dactylifera* L.) cultivars. *Food Chemistry*. 221: 644-649.
- Al-Eid, S.M. 2004. Consumption patterns of fresh dates (Rutab) and full mature dates (Tamr) in the eastern province of Saudi Arabia. (in Arabic). *Arab Journal of Food and Nutrition*. 4(9): 31- 40.
- Al-Eid, S.M., Al-Khayri, J.M., and Al-Bahrany, A.M. 2015. Date palm status and perspective in Saudi Arabia. *In: Al-Khayri, J.M., Jain, S.M., and Johnson, D.V. (Eds.) Date Palm Genetic Resources and Utilization: Volume 2: Asia and Europe*. pp. 49-95. Springer Dordrecht, the Netherlands.
- Al-Farsi, M., Alasalvar, C., Al-Abid, M., Al-Shoaily, K., Al-Amry, M., and Al-Rawahya, F. 2007. Compositional and functional characteristics of dates, syrups, and their by-products. *Food Chemistry*. 104(3): 943-947.
- Al-Farsi, M.A., and Lee, C.Y. 2008. Nutritional and functional properties of dates: A review. *Critical Reviews in Food Science and Nutrition*. 48(10): 877-887.
- Al-Hooti, S., Sidhu, J. S., and Qabazard, H. 1997. Physicochemical characteristics of five date fruit cultivars grown in the United Arab Emirates. *Plant Foods for Human Nutrition*. 50(2):101–113.
- Al-Mssallem, M.Q., and Brown, J.E. 2013. Arabic coffee increases the glycemic index but not insulinemic index of dates. *Saudi Medical Journal*. 34(9): 923-928.
- Al-Mssallem, M.Q. 2014. The association between the glycaemic index of some traditional Saudi foods and the prevalence of diabetes in Saudi Arabia: A Review article. *Journal of Diabetes & Metabolism*. 5(11): 452.
- Al-Shahib, W., and Marshall, R.J. 2003. The fruit of the date palm: Its possible use as the best food for the future? *International Journal of Food Sciences and Nutrition*. 54 (40): 247-259.
- Al-Shreed, F., Al-Jamal, M., Al-Abbad, A., Al-Elaiw, Z., Ben Abdallah, A., and Belaifa, H. 2012. A study on the export of Saudi Arabian dates in the global markets. *Journal of Development and Agricultural Economics*. 4(9): 268-274.
- Baliga, M.S., Baliga, B.R.V., Kandathil, S.M., Bhatd, H.P., and Vayalile, P.K. 2011. A review of the chemistry and pharmacology of the date fruits (*Phoenix dactylifera* L.). *Food Research International*. 44(7): 1812-1822.
- El Hadrami, A., and Al-Khayri, J. 2012. Socioeconomic and traditional importance of date palm. *Emirates Journal of Food and Agriculture*. 24(5): 371-385.
- El-Juhany, L. 2010. Degradation of date palm trees and date production in Arab countries: Causes and potential rehabilitation. *Australian Journal of Basic and Applied Sciences*. 4(8): 3998-4010.
- Elleuch, M., Besbes, S., Roiseux, O., Blecker, Ch., Deroanne, C., Drira, N., and Attia. H. 2008. Date flesh: Chemical composition and characteristics of the dietary fiber. *Food Chemistry*. 111(3): 676-682.
- El-Sohaimy, S.A., and Hafez, E.E. 2010. Biochemical and nutritional characterizations of date palm fruits (*Phoenix dactylifera* L.). *Journal of Applied Sciences Research*. 6(8): 1060-1067.
- General Authority for Statistics. 2015. Detailed results of the Agriculture Census. Saudi Arabia.
- Haddy, F.J., Vanhoutte, P.M., and Feletou, M. 2006. Role of potassium in regulating blood flow and blood pressure. *American Journal of Physiology. Regulatory, integrative, comparative physiology*. 290(3): R546-552.
- Ismail, B., Henry, J., Haffar, I. and Baalbaki, R. 2006. Date consumption and dietary significance in the United Arab Emirates. *Journal of the Science of Food and Agriculture*. 86: 1196–1201.

- Kristensen, M., and Jensen, M.G. 2011. Dietary fibers in the regulation of appetite and food intake. Importance of viscosity. *Appetite*. 56(1): 65-70.
- Kumar, V., Sinha, A.K., Makkar, H.P., de Boeck, G., and Becker, K. 2012. Dietary roles of non-starch polysaccharides in human nutrition: A review. *Critical Reviews in Food Science and Nutrition*. 52(10): 899-935.
- Manickavasagan, A., Mohamed Essa, M., and Sukumar, E. 2012. *Dates: Production, Processing, Food, and Medicinal Values*. CRC Press Taylor and Francis Group, Boca Raton, FL, USA.
- Ministry of Agriculture. 2006. *The Famous Date Varieties in the Kingdom of Saudi Arabia* (Ed. Ministry of Agriculture. Kingdom of Saudi Arabia and Food and Agriculture Organization of the United Nations, p. 245.
- Pamnani, M.B., Bryant, H.J., Clough, D.L., and Schooley, J.F. 2003. Increased dietary potassium and magnesium attenuate experimental volume dependent hypertension possibly through endogenous sodium-potassium pump inhibitor. *Clinical and Experimental Hypertension*. 25(2): 103-115.
- Qazaq, H.S. and Al Adeeb, N.Z. 2010. The consumption pattern of dates and its related food habits among UAE citizens in Al-Ain city, UAE: A pilot study. *Acta Horti*. 882:1083-1089 DOI: 10.17660/ActaHort.2010.882.125.
- Rahman, M.S. 2013. Physical and structural characteristics of date. *In: Siddiq, M., Aleid, S.M., and Kader, A.A. (Eds.) Dates: Postharvest Science, Processing Technology and Health Benefits*. pp 157-169. Wiley Blackwell, Chichester, UK.
- Shabani, F., Kumar, L., Nojoumian, A.H., Esmaeili, A., and Toghyani, M. 2016. Projected future distribution of date palm and its potential use in alleviating micronutrient deficiency. *Journal of the Science of Food and Agricultural*. 96(4): 1132-1140.
- Tang, Z.X., Shi, L.E., and Aleid, S.M. 2013. Date and their processing byproducts as substrates for bioactive compounds production. *Brazilian Archives of Biology and Technology*. 57(5): 706-713
- Vayalil, P.K. 2013. 2013. Bioactive compounds, nutritional and functional properties of date fruit. *In: Siddiq, M., Aleid, S.M., and Kader, A.A. (Eds.) Dates: Postharvest Science, Processing Technology and Health Benefits*. pp 285-303. Wiley Blackwell, Chichester, UK.

الأمن التغذوي للتمور: تحليل تجريبي لمنطقة الأحساء في المملكة العربية السعودية

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الملخص

إن نخيل التمر (*Phoenix dactylifera L*) معروف منذ العصور القديمة في المنطقة العربية، ولا سيما في المملكة العربية السعودية. وقد هدفت هذه الدراسة إلى تقدير استهلاك التمور والمؤشرات التغذوية لها وأهميتها في تأمين الوضع الغذائي للسعوديين في منطقة الأحساء، وعلاقة استهلاك التمور بزيادة الوزن. وشملت عينة الدراسة (477) من الذكور والإناث، موزعة حسب العمر إلى (46) طفلاً، و(72) مراهقاً، و(359) بالغاً، وتم جمع البيانات من القياسات البشرية، والعوامل الاجتماعية والاقتصادية، واستهلاك التمور من المشاركين، ثم تم تحليل المستهلك من التمور، وتقدير مؤشرات الطاقة والنشويات والألياف الغذائية وبعض المعادن والفيتامينات للتمور المستهلكة.

توصلت الدراسة إلى أن أعلى استهلاك للتمور كان من قبل المراهقين، يليهم البالغين، وكشفت النتائج أيضاً أن التمور المستهلكة في هذه الدراسة يمكن أن تؤمن نحو ربع المتطلبات اليومية الموصى بها من البوتاسيوم، والخمسة لكل من المغنيسيوم والألياف الغذائية، ووجدت الدراسة أيضاً أنه ليس هناك فروق ذات دلالة إحصائية لاستهلاك التمور بين المصابين بالسمنة وناقصي الوزن، وكان الارتباط بين استهلاك التمر ومؤشر كتلة الجسم ضعيفاً جداً، وأكدت الدراسة أهمية الاستهلاك اليومي للتمور في تأمين بعض المعادن الضرورية للجسم، وخلصت إلى أن استهلاك التمور غير مسؤول عن زيادة الوزن.

الكلمات المفتاحية: استهلاك التمور، عناصر غذائية، قياسات جسمية، مؤشرات تغذوية، مؤشر كتلة الجسم.