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CALORIC VALUE AND SENSORY PROPERTIES OF HAYANY DATE SUPPORTED BY DIFFERENT PROTIEN SOURCES

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ABSTRACT

Hayany date variety were spread in North Sinai region, Hayany date was dried by different treatments .The products sensory evaluated and the promised treatment (oven drying at 60 C,^{o}) was supported by 20% of four different protein sources (dry skim milk , peanut , sesame and soy bean).In the same time the products were homogenized then coconut 5% or cinnamon 3% as flavor were added to each varity products. The final products were sensory and chemically evaluated. Results showed that. Sesame protein treatment recorded the highest organoleptic scores for products either flavored by coconut or cinnamon .While soybean protein recorded the lowest organoleptic scores for products either flavored by coconut or cinnamon. Sesame protein treatment recorded the highest caloric value either flavored by coconut or cinnamon, although, it had the lowest value of carbohydrates, while soybean recorded the lowest caloric value either flavored by coconut or cinnamon , although it had the highest value of protein.

INTRODUCTION

Date is an important commercial crop in Middle East and Arab countries. Egypt lies in the first largest date producer among Arab and world countries as represent in the following table.

Date production in the middle east countries (main producers) in 2004 (FAO Statistics 2004)

Country	Production
Egypt	1,100,000 t (16.2% of World production)
Iran	880,000 t (13.0% of World production)
Saudi Arabia	830,000 t (12.3% of World production)
United Arab Emarates	760,000 t (11.2% of World production)

North Sinai region is one of the most important date cultivated areas in Egypt. The most cultivated date varieties is Hayany date which spread in El-Arish city The different produced varieties of date in Egypt are firstly the soft varieties of dates such as Hayany ,Amhat ,Zaghloul,Samany and bent Aisha, secondly the semi dry varieties of dates such as Amry ,Aglany and Sewi. Then the dry varieties of dates such as Sakoty and Gandila. ,(Nezam ElDin 2000)

This investigation was amid to improve the nutrition and caloric values by fortification date paste with different protein sources such as (dried skim milk , peanut ,sesame and soybean) to prepared substitute meals for school children.

MATERIALS AND METHODS

Materials :Hayany date variety (soft dates) at rutb stages were obtained (North Sinai Governorate) from local Market of El-Arish city.

Skimmed milk powder spray low heat (by Avan Milk. Holand B.V)reconstituted milk (1:10), fat (1.25% max) moisture (4% max).was purchased from El- Arish local market.

Defated soybean flour (protein 50% max and fat 5.2 % max) were obtained from Food Technology Research Institute , Agricultural Research Center ,Giza, Egypt.

Peanut dehusked, Seasem , Coconut and Cinnamon powder were obtained from the local market of El-Arish city.

Hayany date at rutab stage dried by oven drying at 60 ^{O} C .to 6 hours ,cleaned and prepared then supported by 20% of different sources of protein and homogenized then 5% coconut or 3% cinnamon as flavor were add and homogenized . The final products were packaged in aluminum foil and stored at room temperature

Methods

Chemical analysis:

- **Crude protein** of the fresh date samples was determined by Kjeldahl method as described in A.O.A.C. (1990).
- **Fat content** of the fresh and product date samples was determined by Sokaelt method as described in A.O.A.C. (1990).
- **Carbohydrates** were calculated according to Mohamed ,(2003) by the difference as follow:

  Carbohydrates = 100 - (protein + fat + ash + fiber)
- **Determination of Caloric value:**

Caloric value of date products after supporting by different protein sources were calculated by mathematics method

Where 1g of fat = 9 k calorie

1g of protein = 4 k calorie

1g of carbohydrates = 4 k calorie

Organoleptic evaluation:Date products were organoleptically evaluated for its taste, color , texture and odor according to the method of Sumainah,and El- Nahal.(1984) And Yousif *et al* (1990). by ten panelists using a numerical basis of one to ten (where one = very bad and 10 = excellent).

Statistical analysis:The obtained data of the organoleptic evaluation were statistically analyzed according to Snedecor and Cochran (1980)

RESULTS AND DISCUSSION

Chemical composition of Hayany date palm after protein supported

Dates have high caloric ,nutritive value and medical as well . On the other hand ,dates are relatively low in protein and fat ,therefore , the addition of protein sources such as powder skim milk ,chocolate and nuts(Yousif and Ramadan 1987). We can supported date palm by different sources of

protein such as sesame , peanut and soy bean and we can addition different sources of flavor such as coconut and cinnamon. This addition was application in these investigation.

Table (1): Caloric value of Hayany date (100 g) after supported by different protein sources(on dry weight basis)

Treatments / Samples	Hayany date with 5% Coconut				Hayany date with 3% cinnamon			
	Fat	Protein	Carbo.	Caloric v.	Fat	Protein	Carbo	Caloric v.
Hayany date(Control)	2.8	3.6	83.2	372.4	2.8	3.6	83.2	372.4
Hayany date supported with 20% skim milk powder	3.6	7.2	78.8	376.4	3.2	8	78.4	374.4
Hayany date supported with20% sesame powder	10.5	7.6	71.5	410.9	9.7	7.7	72.2	406.9
Hayany date supported with 20% peanut powder	8.3	7.1	74.2	399.9	5.9	7.5	76.1	388.4
Hayany date supported with20% soy bean powder	6.4	9.0	74.2	390.4	4.8	9.5	75.8	384.4

Results in table (1) showed that the fat content of Hayany date was (2.8%). All treatments after supporting with different sources of protein were increased in fat content. The increment ranged between (0.8– 7.7%) in Hayany coconut treatment ,(0.4–6.9) in Hayany cinnamon treatment

The previous data showed that the highest value of fat after supporting by different sources of protein (skim milk, sesame, peanut and soybean) was that of sesame followed by peanut, soybean and skim milk for Hayany date. This may be due to the higher fat content of sesame seeds, as reported by Sawaya *et al*., (1985) who found that the paste of dehusked roasted sesame seeds, from Saudi Arabia and other countries, contained 58.9%, fat . Also the lowest fat content was that of skim milk treated sample it may be due to that skim milk used in this investigation was contained (1.25%) of fat .

The presented data (Table 1) showed that coconut treated samples as flavor, had higher fat content comparing to cinnamon treated samples for Hayany samples. This may be according to higher fat content of coconut oil comparing with that of cinnamon

Results in Table (1) and distinguished that the total carbohydrates of Hayany dates(83.2%). These results were similar to that of Ramadan (1995) who reported that the date fruits contained about 80-85 % carbohydrates . Also the tabulated results showed that total carbohydrates decreased after supporting by different sources of protein. . The supported Hayany date by sesame protein recorded the lowest content of carbohydrates , it may be due to the higher content of fat and protein of sesame seeds.

Data in Table (1) indicated that the total protein of Hayany (3.6%) (on dry weight basis) .

From the same Table it could be observed that all treatments after supporting by different sources of protein were increased in protein content. The increment ranged from (3.5– 5.4%) in Hayany coconut treatments, (3.9–5.9%) in Hayany cinnamon treatments, The mentioned data demonstrated that the highest value of protein content after supporting by different protein sources was recorded for samples treated of Hayany products with defatted soybean flower followed by the sample treated with sesame powder then skim milk powder and lastly the sample treated with peanut. These results could be explained as a results of the protein content of both soybean and sesame comparing with other used sources of protein (Sengaer and Sharma 2003 and Sawaya *et al* ., 1985**)**

Caloric value of date products

Dates are rich in certain nutrients and provide a good source of rapid energy due to their high carbohydrate content (70-80 %) ,most of the carbohydrates in dates are in the form of fructose and glucose which are easily absorbed by human body (Imad and Abd ELWahad 1995)

The caloric value of Hayany date products prepared with protein supporting (dried skim milk , sesame , peanut and soybean) was calculated and presented in Table (1). Results in Table (1) indicated that the caloric value of 100g of Hayany date palm control was 372.4. on dry weight basis .These results are in agreement with Ramadan (1995) who reported that the calorific value of the tamrscuit varied between 400.8 -405.9 Cal / 100 g on dry weight basis while AL- Farsi *et al* ,. (2005) studied the compositional and sensory properties of three native sun-dried date varieties grown in Oman and reported that the dates palm are a good source of energy (278 – 301 kcal/ 100 g) ,due to the high sugar content.

Results in Table (1) indicated that the nutritional and caloric values of Hayany date products flavored by coconut were increased as a result of protein supporting by different sources. From the presented data, it could be observed that sesame treated sample recorded the highest caloric value (410.9 cal./100g) compared with the other studied treatments, followed by peanut treated sample (399.9 cal./100g) , soya bean treated sample (390.4 cal./100g) and then skim milk treated sample (376.4 cal./100g).

The same trend could be noticed in the case of Hayany date product of flavored by cinnamon where the nutritional and caloric values were also increased in all treatments. Sesame treated sample recorded the highest caloric value (406.9 cal./100g) compared with the other studied treatments, followed by peanut treated sample (388.4 cal./100g) , soya bean treated sample (384.4 cal./100g) then skim milk treated sample(374.4 cal./100g).

From the same Table, it could be demonstrated that Hayany date products flavored by coconut had higher caloric value that those of cinnamon Hayany date products, this may be due to the higher fat content of coconut comparing with cinnamon.

Sensory properties of Hayany date products

Most of the produced dates are used directly for human consumption with little processing .The development of new date products is required to absorb the surplus dates and to increase quality. Date fruits are considered an excellent source of readily available energy (about 80-85 %

carbohydrates), supplying about 200-300cal /100g, Ramadan (1995). Dates also contains a moderate amounts of thiamin ,riboflavin and folic acid. They are a good source of nutritionally important minerals, trace elements and dietary fibers, but dates have a relatively low protein and fat contents,(Yousif *et al*, (1990). Therefore ,incorporation of dates into other protein food items such as powder skim milk ,peanut ,sesame and soybean protein .

Dried Hayany date supported by different sources of protein (dried skim milk, sesame, peanut and soy bean) after adding coconut as a flavor (5%) were evaluated for, taste ,color, texture and odor, (scores 25 degree).

The obtained results were statistically analyzed and presented in Table (2) indicated that. Sesame and peanut treated samples recorded ,the highest taste scores (21.88 and 21.65), respectively with no significant differences between them. On the other hand, they were significantly higher than the other studied treatments. This may be due to the higher content of fat for these two sources in addition to their desirable flavors.

Concerning to the color , it could be observed that sesame treated sample had the highest value (22.08) which significantly higher than the other treatments. The same situation was observed for the texture and odor, where the highest recorded scores were those of sesame treated sample (21.45 and 21.25, respectively). From the mentioned data man can say that the sesame treatment is the best treatment in relation to organoleptic characteristics followed by peanut treatment . These results demonstrated that the dates could be used as a good substitute for sugar in the formulated baby foods and fortification by a high protein sources of Ramadan (1995).

Table (2): Sensory evaluation of Hayany date after supported by different sources of protein and flavored with 5% coconut.

Samples	Taste (25)	Color (25)	Texture (25)	Odor (25)	Overall acceptability (100)
Control (100%)	17.9 c	18.33 d	18.53 d	18.33 d	73.00
Supported with (20%) skim milk	18.33 bc	18.53 cd	19.58 c	18.53 c	74.77
Supported with (20%) sesame	21.88 a	22.08 a	21.45 a	21.25 a	86.66
Supported with (20%) peanut	21.65 a	20.40 b	20.63 b	20.00 b	82.68
Supported with (20%) soybean	18.95 b	19.15 c	19.78 c	18.13 c	76.01
L.S.D	0.3433	0.2953	0.2746	0.2277	

a, b and c means in the same column with different superscripts are significantly different (P ≤ 0.05)

Dried Hayany date supported by different sources of protein (dried skim milk , sesame, peanut and soy bean) after adding cinnamon as flavor (3%) were evaluated for taste, color, texture and odor(scores 25 degree) , then the obtained results were statistically analyzed and presented in Table (3). The tabulated results indicated that sesame ,peanut and skim milk treated samples recorded the highest taste scores 21.88, 20.63 and 18.53 , respectively ,with no significant differences between them. The same trend was observed for sesame and peanut treated samples in relation to the texture ,where were the recorded texture value of sesame treated sample was 20.40 which not significantly different from that of peanut treated sample 20.20.

Table (3): Sensory evaluation of Hayany date after supported by different sources of protein and flavored with3% cinnamon

Samples	Taste (25)	Color (25)	Texture (25)	Odor (25)	Overall acceptability (100)
Control (100%)	18.33 b	17.28 c	18.75 b	18.83 c	72.69
Supported with (20%) skim milk	18.53 a	19.15 b	17.70 c	18.53 c	73.91
Supported with (20%) sesame	21.03 a	21.45 a	20.40 a	20.63 a	83.51
Supported with (20%) peanut	20.63 a	18.95 b	20.20 a	19.58 b	79.36
Supported with (20%) soybean	17.28 c	18.53 b	18.53 b	17.90 c	72.24
L.S.D	0.2746	0.2569	0.2328	0.2992	

a, b and c means in the same column with different superscripts are significantly different ($P \leq 0.05$)

Concerning to the color and odor it was observed that sesame treated sample recorded the highest values in both of them 20.45 and 20.63 , respectively, which were significantly higher than the other studied treatments.

From the previous results it could be concluded that sesame treated sample is the best treatment in relation to sensory properties followed by peanut treated sample

Demand for dates could be increased significantly if nutrition value was improved and availability was increased .This could help to avoid some of the health problems such as chronic diseases appearing in humans due to excessive consumption of high fat ,low fiber and refined food typical of the diet in Europe and USA. These diseases are beginning to appear in developing countries as they tend to adopt similar lifestyles and eating habits .We can also speculate that dates may have other as yet unknown, health and medical benefits .Dates could have an important all –round role to play in dietary health . There is every possibility that they contain other components that may have useful functional properties.

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القيمة السعرية والصفات الحسية للبلح الحيانى بعد تدعيمة بمصادر لبروتين المختلفة

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قسم تكنولوجيا علوم الأغذية و الألبان –كلية العلوم الزراعية البيئية جامعة قناة السويس

يعتبر الصنف الحيانى من أكثر الأصناف انتشارا فى شمال سيناء لذلك تم تجفيفه بطرق مختلفة وباستخدام التقييم الحسي تبين ان افصل طريقة لتجفيف البلح الحيانى هى طريقة لتجفيف في الفرن على درجة حرارة ٦٠ مئوية. ثم بعد ذلك تم تدعيمة بأربعة مصادر مختلفة من البروتين بنسبة ٢٠% (بروتين اللبن الفرز المجفف,السمسم ,الفول السوداني والفول الصويا) ثم أضيفت جوز الهند بنسبة ٥% وكذلك القرفة بنسبة ٣% كمصدر للنكهة وقد أجريت التقديرات الكيميائية وكذلك الحسية وأظهرت النتائج أن تدعيم البلح ببروتين السمسم تعتبر أفضل المعاملات من حيث القيمة السعرية والحسية فى كل من جوز الهند والقرفة بينما سجلت معاملة الفول الصويا اقل معدلات من حيث القيمة السعرية والحسية على الرغم من احتوائها على نسبة عالية من البروتين.