

NOTE

USE OF DATE HONEY IN THE FORMULATION OF NUTRITIOUS CREAMY FOOD

I. ALEMZADEH, M. VOSSOUGH, A. KESHAVARZ AND V. MAGHSOUDI¹

Biochemical and Bioenvironmental Research Center, Sharif University of Technology, Tehran, Iran; and Agricultural Engineering Research Institute, Evin, Tehran, Iran (3rd author).

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ABSTRACT

Date is an important fruit crop in many Middle East countries. Date syrup is an important by-product of date. Clarified and purified date syrup is named date honey. It could be utilized as a replacer for sugar in preparing different food formulations. A new food formulation was processed, the essential ingredients of which being date honey, butter, hazelnut, dried skim milk, cocoa, starch, lecithin, and baking soda. Date honey is a good source of energy, and is relatively low in protein. Therefore, the addition of protein sources such as dried skim milk, nuts and other ingredients resulted in a nutritious formulated food containing 6.13% protein, 19.86% fat, 47.80% total sugar and was rich in certain mineral elements. A single stimulus-consumer test was conducted in order to evaluate the acceptability of the four formulations prepared by using different amounts of date honey and cocoa. The results indicated that formulation 1 containing 60 g date honey and 10 g cocoa was the most acceptable.

1. Associate Professors, Researcher and Research Assistant, respectively.

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استفاده از عسل خرما در فرمولاسیون کرم مغذی

ایران عالم زاده ، منوچهر وثوقی ، عباس کشاورز و ویدا مقصودی

به ترتیب دانشجویان مرکز تحقیقات مهندسی بیوشیمی و کنترل محیط زیست ، دانشگاه صنعتی شریف، تهران، ایران، پژوهشگر موسسه تحقیقات مهندسی کشاورزی- اویسن، تهران، ایران و کمک پژوهشگر مرکز تحقیقات مهندسی بیوشیمی و کنترل محیط زیست ، دانشگاه صنعتی شریف، تهران، ایران.

چکیده

خرما یکی از اقلام مهم کشاورزی در خاور میانه است. یکی از محصولات جانبی خرما شیره خرما می باشد. از تخلیص و شفاف سازی شیره خرما، عسل خرما حاصل می شود. از عسل خرما می توان به عنوان جایگزین قند در فرمولاسیون مواد غذایی استفاده نمود. فرمولاسیون یک محصول جدید غذایی بررسی شد. مواد اصلی در تهیه این فرآورده شامل: عسل خرما، کره، فندق، شیر خشک فاقد چربی، کاکائو، نشاسته، لسیتین و پف کننده کیک بود. عسل خرما یک منبع قابل توجه انرژی است و با افزودن منبع پروتئینی مانند شیر خشک، فندق و مواد دیگر، موجب تولید یک محصول مغذی می شود که شامل ۶/۱۳ درصد پروتئین، ۱۹/۸۶ درصد چربی، ۴۷/۸ درصد قند کل و میزان قابل توجهی مواد معدنی است. جهت تعیین قابلیت پذیرش محصول، چهار رنوع فرمول غذایی با مقادیر مختلف عسل و کاکائو تهیه گردید. نتایج حاصله نشان می دهد که فرمولاسیون شماره یک که دارای ۶۰ گرم عسل خرما و ۱۰ گرم کاکائو است پذیرش قابل ملاحظه تری دارد.

INTRODUCTION

Confectionery refers to sweet goods and takes on a different meaning depending on the place in which it is used. In some countries, the term applies to any sweet product, including cakes. In others, confectionery is candy and includes terms such as fondants, caramels, toffees, jellies, chocolate-covered fruits, nuts and creams (5, 10, 11).

To create innovative products with unique shape, textures and flavor, confectioners should carefully choose the ingredients. There are a variety of ingredients, the selection of which is critical, as it can prevent or invite potential problems in the finished confections.

Date syrup is obtained from date by water and heat extraction (1, 2). Date syrup can be used in confectionery such as cake formulation (10). Clarified date syrup, which is called date honey, can be used as a replacer for sugar and is a good source of energy in many different food formulations. The addition of protein sources such as hazelnut and dried skim milk would provide a nutritious food formula which could be considered as confectionery, breakfast cream and child food (2).

In this investigation a new formulation was prepared using date honey, hazelnut, skim milk, cocoa and additives. Four formulations of this new food were prepared and sensory evaluation was carried out on them, using a single-stimulus consumer test to evaluate the acceptability of the formulations (6, 8).

MATERIALS AND METHODS

Date honey was supplied by the Iranian Date Syrup Processing Plant in Tehran (1). Other ingredients, such as hazelnut, dried skim milk, butter, cocoa, vanilla, starch and baking soda were purchased from the local market. Hazelnuts were peeled, dried and crashed in a coffee mill.

Starch was dissolved in cold water and mixed occasionally with date honey, milk and butter and the preparation was cooked at 118° C for 3 min.

Heat was turned off and cocoa, vanilla, baking soda and lecithin were added. They were then mixed well and crashed hazelnut was added and whole mixture was mixed well again to obtain a creamy product.

A total of four combinations of date honey and cocoa were prepared (formulations 1-4). The amount of the other ingredients were constant in all formulations.

The best formulation was chosen on the basis of organoleptic acceptability (6, 8) and was analyzed for moisture, ash, protein and sugar contents (3, 4, 9). Potassium and sodium were determined using flame photometry, while calcium and iron were estimated using an atomic absorption spectrophotometer (3). Chemical analyses were done in two replicates and the calorie value of the creamy food was calculated from the standard tables (7). Sensory evaluation of the new formulations was conducted using a single-stimulus consumer test. One hundred samples of each of the four formulations were prepared and presented to 100 consumers, chosen at random from both sexes aged 10-45 years. Panelists were asked to indicate their preference for the four samples they were tasting by checking one of five possible answers which constituted the hedonic scale (6).

RESULTS AND DISCUSSION

The results of date honey analysis are summarized in Table 1.

Table 1. Chemical composition of date honey.

Component	Amount (%)
Moisture	21.97
Protein (N×6.25)	1.99
Ash	1.92
Total sugar	84.88
Reducing sugar	80.05

The recipe for the date honey-based food is shown in Table 2 and its chemical composition is summarized in Table 3. As shown in Table 3, the

Use of date honey in the formulation ...

prepared food is a significant source of energy and could be recommended, for example, as a child food.

Table 2. Recipe for date honey creamy food (formulation 1).

Ingredient	Amount (g 120 g ⁻¹ sample)
Date honey	60
Cocoa	10
Dried skim milk	15
Hazelnut	20
Butter	15
Starch	2
Lecithin	0.1
Vanilla	0.5
Baking soda	0.5
Water	1

Table 3. Chemical composition of formulation 1.

Component	Amount (%)
Moisture	13.2
Protein (N×6.25)	6.13
Fat	19.86
Fiber	0.47
Ash	2.74
NFE*	58.08
Total sugar	47
Reducing sugar	36.5
K (mg 100 g ⁻¹)	297.5
Na (mg 100 g ⁻¹)	65.0
Ca (mg 100 g ⁻¹)	82.2
Fe (mg 100 g ⁻¹)	30.1
P (mg 100 g ⁻¹)	217.4
Food energy (kcal 100 g ⁻¹)	391

* Nitrogen free extract (soluble carbohydrates).

Addition of hazelnut and skimmed milk in the creamy food increased the protein content by approximately 3 fold. Such a product is anticipated to

enhance the effort in the date producing countries to improve their nutritional status by introducing a nutritious food for the pre-school and school-age children. The development of a high protein date food might find potential to opening a new channel for introducing date-based products.

Table 4 presents part of the composition of the four formulations. The amount of other constituents in these four formulations are as in Table 2.

Table 4. Partial recipes for different formulations.

Ingredient (g 120 g ⁻¹ sample)	Formulation			
	F1	F2	F3	F4
Date honey	60	65	55	50
Cocoa	10	5	15	20

The data from taste panel are presented in Table 5. It can be concluded that there is a notable difference in acceptability of different formulations.

Table 5. Responses of acceptability of four formulations.

Response	Numerical value	Formulation			
		F1	F2	F3	F4
Like very much	+2	30	14	3	0
Like	+1	30	30	20	10
Neither like nor dislike	0	20	34	30	30
Dislike	-1	16	12	39	50
Dislike very much	-2	4	10	8	10
Sum		100	100	100	100

Table 5 indicates that the formulations 3 and 4 are the least acceptable and that formulation 1 is more acceptable than formulation 2.

CONCLUSIONS

Date honey was utilized as a sugar replacer in a new date-based formulation. Addition of a protein source (skim milk), fat (butter), and other ingredients improved the quality of this formula. The formula chosen

was a source of minerals such as iron, potassium, calcium and energy (391 kcal 100 g⁻¹). This nutritious food may be recommended as a confectionery or an emergency food for children.

LITERATURE CITED

1. Alemzadeh, I. and M. Vossoughi. 1990. Nutritive value of date. Annual Sharif Proceedings. 339-341 (in Farsi).
2. Alemzadeh, I., M. Vossoughi and A. Keshavarz. 1996. Formulation of a by-product from date. Export Development Seminar, January 1996, Ahwaz, Iran (in Farsi).
3. AOAC. 1990. Official Methods of Analysis. 15th ed. Association of Official Analytical Chemists, INC. Washington DC, U.S.A. 503-504.
4. Birch, G.G. 1985. Analysis of Food Carbohydrate. Elsevier Applied Science, New York, NY, U.S.A. 28-37.
5. Dziezke, J.D. 1989. Ingredients for sweet success. Food Technol. 43: 94-116.
6. Kapsalis, J.G. 1987. Objective Methods in Food Quality Assessment. CRC Press, Boca Raton, Fl, U.S.A. 62-76.
7. Khan, R. 1993. Low Calorie Foods and Food Ingredients. Blackia Academic and Professionals. 31-37.
8. Kramer, A. 1970. Quality Control for the Food Industry. AVI Pub. Co., Inc. Westport, CT, U.S.A. 120-152.
9. Pearson, D. 1973. The Chemical Analysis of Food. Butterworths, London, England. 27-77.
10. Sayed, M.A. 1992. Date syrup as sweetener in cake and confectionery products. M.Sc. thesis, Tarbiat Modarres University, Tehran, Iran (in Farsi).
11. Yousif, A.K. and B.T. Saeed. 1987. Use of date paste in the processing of nutritious candy bars. Date Palm J. 5:107-116.