Page 618 to 633

Volume 3 • Issue 2 • 2018

Research Article

Nutrition and Food Toxicology

ISSN: 2573-4946

# Efficacy of Fortification and Replacement by Different Levels of Milk and Dibs on Physiochemical and Sensory Evaluation of Date Compote

**Ferweez H[1]* and HA Ismail[2]**

[1]*Food Sci. and Techno. Dept., Fac. of Agric., New Valley Branch, Assiut University, Egypt*

[2]*Dairy Sci. and Techno. Dept., Fac. of Agric., New Valley Branch, Assiut University, Egypt*

***Corresponding Author:** Dr Ferweez H, Food Sci. and Techno. Dept., Fac. of Agric., New Valley Branch, Assiut University, Egypt.

**Received:** July 01, 2018; **Published:** July 19, 2018

## Abstract

Date compote manufacture supported by milk as source for the fat and protein and dibs as an alternative to sugar partial or whole, is highly nutritious and economically cheap. Therefore, this research was study the effect of fortification by different levels of milk (0.0, 25 and 50% of date weight) and dibs by different levels as an alternative to sugar (0.0, 50, and 100% of sugar solution) on physiochemical and sensory evaluation of date compote.

The obtained results revealed that fortification of date compote by milk and replacement dibs as an alternative to sugar solution as different levels had a significant effect on physiochemical composition of date compote, i.e. total solids %, total dietary fibers %, total protein% , total lipids % , ash% and pH value; sugars composition of date compote, i.e. total sugars %, reducing sugars%, sucrose%, glucose% and fructose % except glucose/fructose ratio; minerals composition of date compote, i.e. Potassium (K), , Sodium (Na) , Calcium (Ca) ,Magnesium (Mg) and Iron (Fe) contents (mg/100g); essential amino acids composition of date compote (histidine, isoleucine, leucine, lycine, methionine, phenylalanine tryptophan and valine) and non-essential amino acids composition of date compote, i.e. alanine, arginine, aspartic, cysteine, glutamic, proline, serine and tyrosine and sensory evaluation of date compote (flavour, appearance, taste, and consistency).

Generally, it could be demonstrated from the results in this work that date compote supported by milk at 50% and dibs as alternative to sugar at 100% of date weight is the best, accept, highly nutritious and economically cheap.

***Keywords:*** *Date flesh; Dibs; compote; Minerals; Amino acid and milk*

Volume 3 Issue 2 July 2018



## Introduction

New Valley Governorate is one of the common governorates in Egypt in the production of dates (Phoenix dactylifera L.) about 45 a thousand tons. Egypt is producing 1.50 million tons of dates annually which represent 17.70% of the world production (FAO, 2017). The fruit of the dates are good sources of sugars, fiber, contain many important vitamins such as vitamin C, pro-vitamin A, and minerals, containing significant amounts of calcium, iron, fluorine, and selenium (Al-Shahib, and Marshall 2003). Dates are an important source of

calories with about 78% carbohydrates 2-3% proteins and 1% fat (Nasehi., *et al*. 2012). The major parts of the carbohydrates in dates are in the form of fructose and glucose (Ishurd and Kennedy, 2005). The fruit contained 32% glucose and 30% fructose, while the water-insoluble fibers of its flesh consisted of 49.9% lignin and 20.9% polysaccharides (Shafiei., *et al*.; 2010). The sugars in dates are easily digested and can immediately be moved to the blood after consumption and can quickly be metabolized to release energy for various cell activities (Khan., *et al*. 2008). High date fruit consumption can reduced risk of several chronic diseases such as coronary heart disease, cardiovascular disease, cancer, aging, atherosclerosis, neurodegenerative disease, tumor, and mutagens (Al-Farsi., *et al*. 2008; Gad., *et al*. 2010). Date has antitumor activity, antioxidant and anti-mutagenic properties (Abbes., *et al*. 2013). Surplus dates are made into cubes, spread, paste, powder (date sugar), jam, jelly, juice, syrup, vinegar and alcohol. Dates are usually taken as such or with Arabian coffee, milk, or yoghurt, and are used in many bakery or confectionary products together with chocolate, coconut, honey and vinegar (Besbes., *et al*. 2009).

Date syrup (Dibs) is a produced in the home and village by extraction and boiling down of juice and on a semi and full industrial scale. It is product obtained from matured product with about 67-72% solid concentration consisting of 95% reducing sugar (Rofehgari-Nejad., *et al*. 2010). Date syrup as the main and general by-product of date is used for foodstuffs such as jams, marmalades, concentrated beverages like dough, kashk, chocolates, ice cream, yoghurt dessert, confectioneries and honey, bakery products, sesame paste/date syrup blends, jam and some other like sweets, snacks, and health foods (El-Sharnouby., *et al*. 2009). However, dates are known to be rich in carbohydrates (80%) but quite low in protein among 2 to 3% (Kaushik., *et al*. 2016).

Milk has good quality protein such as caseins and whey proteins, which contain essential amino acids and fat and minerals. It must has good amount of calcium and vitamins, specially vitamin A, B and C, riboflavin, niacin and folic acid, which are very important for biological processes and normal growth of body (Ismail. 2015). The milk which deficient with iron content compared with other food (Miguel., *et al*. 2003). Many studies had indicated that date and its processing by-products are good substrates for the production of dairy products. In this study made date compote from date flesh with date syrup (Dibs) substitute to sugar and fortified by milk attribute to improve the sensory characteristics and nutritional value of date compote that might be consumed as new functional product. Consequently, the purpose of this study is to study effect of fortification by the different levels of date syrup (dibs) and milk on physiochemical parameters and sensory evaluation of date compote.

## Materials and Methods

This work was carried out in Foods & Dairy Science and Technology Departments Laboratories, Fac. Agric. New Valley Branch, Assuit Univers., Egypt, during 2016 and 2017 working seasons to evaluate effect of fortification by the different levels of date syrup or dibs (as a sugar replacer) i.e. 0.0, 50.0 and 100% of the sugar solution and milk (0.0, 25.0 and 50% of date weight) on physiochemical parameters and sensory evaluation of date compote. Sugar solution concentration used in processing of date compote is 65%

### Materials

#### Date fruits

Saidy cultivar of date (Phoenix dactylifera L.) high quality fruits at Tamr stage were sorted, obtained from the Elforqan Date Packing Factory of El-Kharga City, New Valley Governorate, Egypt. 2-1-2-Milk Fresh cow's milk (88.22% moisture, fat 3.50 %, protein 3.04%, Lactose 4.55%, ash 0.68%, acidity 0.17% and pH 6.6) analyzed by Milk Scan (Bulgaria). Milk was obtained from dairy farm of El-Kharga City, New Valley Governorate, Egypt. The milk was reduced to about one-fourth of its original volume by slow evaporation before the use.

#### Preparation of date flesh and syrup (Dibs)

According to (Kaushik1., *et al*. 2016), the pulp of date was separated from kernel, then the pulp was weighted and washed twice and dried, this called date flesh used in processing date compote and other part from washed pulp (date flesh) was extracted by 1:3 (date flesh:water) at 70ºC for two hours with stirring at intervals. The produce juice was filtered in cheese clothes (double layer). Then, juice

was concentrated using water bath at 70ºC and stir it occasionally to avoid burning at the bottom until total soluble solids reach 75% and place in a cool condition for storage until use it.

**Preparation of date compote**

Date compote is normally prepared by heating 1 kg date flesh in 1.5 liter sugar solution (75%) or dibs (75%) with/or without milk according to the studied previous treatments in a simultaneously using water bath at 70ºC for 20 minutes with stirring at intervals.

**Treatments of sugar replacement**

1. Date compote (Control) without dibs (zero% dibs + 100% sugar solution),
2. 50% dibs: Compote replaced by 50% dibs
3. 100% dibs: Compote replaced by 100% dibs.

**Treatments of fortification by Milk**

1. Date compote (Control) without milk (zero milk).
2. 25% Milk: Compote fortified by 25% Milk.
3. Milk 50% Compote fortified by 50% Milk.

Control of date compote samples was prepared without dibs and milk (T1). When samples contained zero dibs + milk 25% (T2), zero dibs + milk 50% (T3), dibs 50% + zero milk (T4), dibs 50% + milk 25% (T5), dibs 50% + milk 50% (T6), dibs 100% + zero milk (T7), dibs 100% + milk 25% (T8) and dibs 100% + milk 50% (T9).

The representative samples of date compote were packed in 500 ml brown plastic containers and were kept in the refrigerator. The chemical analyses, physical characters, and sensory features were carried out on fresh date compote.

**Analytical Methods of date flesh, dibs and date compote samples**

Physiochemical parameters of date compote, Total soluble solids (TSS) % was determined by "Abbe" Refractometer at 20°C. Moisture, ash, pH; titratable acidity and dietary fiber content of date flesh and compote were quantified using procedure of the AOAC (2005). Protein was determined by Kjeldahl. The protein content was expressed as nitrogen multiplied by a factor (6.25 for date flesh or syrup and 6.38 for milk).

**Sugars**

Reducing sugar and total sugars were determined according to Lane and Eynon volumetric method using titration with Fehling's reagents (Ranganna. 1986). Non-reducing sugars content was calculated by difference and mineral analysis: Calcium, Magnesium and Iron were determined using the Atomic absorption, while Potassium and Sodium were determined using Flame photometer as in AOAC (2005).

**Lipid Extraction**

Homogenized tissue (10g) was progressively added to small amounts of a chloroform/methanol 2:1 (v/v) mixture (up to 200 ml), with vigorous shaking, and then the extraction was carried on for a further 2h, using an electromagnetic stirrer. The mixture was filtered and the filter was rewashed with fresh solvent and pressed according to Folch method as in AOAC (2005).

**Amino Acid Analysis**

Amino acid analysis, using vapor HCl hydrolysis of samples and standards at 110 degrees C for 19-20 hours. After hydrolysis, samples submitted on PVDF are extracted three times with 100 microliters of 40% acetonitrile/0.5% trifluoroacetic acid and the extracts dried

completely in a Speed vac before re-suspension in sample buffer. Amino acids were determined as mg/100 g date compote on dry weight basis. Samples and standards are then analyzed using a Beckman 6300 system according to the official standard method (AOAC, 2005).

### Sensory evaluation of date compote

Representative samples were examined for sensory preference test in a hedonic scale of 10 points, where 1 (one) was for dislike very much and 10 (ten) for like very much. The sensory evaluation of the resultant samples was judged by staff members and semi-trained panelists for taste, flavor, color and overall acceptability as described in (El-Nagga., *et al*. 2012) with some modifications.

### Statistical analysis

The results of this study were analyzed using SPSS (Version 20) software. Data analysis method used for analysis of variance (ANOVA) and Duncan's post hoc test ($P < 0.05$).

## Results and Discussion

### Physicochemical composition of date flesh and date syrup (dibs)

Analysis of date flesh as shown in Table (1) revealed that the moisture, dry matter, dietary fiber, protein, lipids, ash and total sugar and reducing sugars content were within 11.69, 88.31, 8.34, 1.72, 2.04, 1.85, 74.95 and 71.14%, respectively. Anyway these results were, in general, comparable to those reported previously (Borchani., *et al*. 2010) and (Assirey. 2015). (Al-Hooti., *et al*. (1997) found date flesh contains protein content very little, and therefore not a good source of protein. Although date flesh had relatively low protein, fat and ash contents, it's had a high amount of reducing sugars namely fructose and glucose. The low lipid content compared with the high sugar content of dates is a good indicator for its potential uses. Date flesh was a super source of dietary fiber (8.34% on dry weight basis, DWB). Dietary fibers diets are associated with the prevention of some diseases for example constipation, colonic cancer, diverticular disease, coronary heart disease, cardiovascular disease, atherosclerosis, diabetes and obesity (Al-Farsi., *et al*. 2007). As well dietary fiber concentration should have a balanced content of soluble and insoluble fraction (Hasnaoui., *et al*. 2012). This is necessary for food industry and ability to transformation on new products is available in the markets.

| Chemical Composition | | Date Flesh | Date Syrup (Dibs) |
|---|---|---|---|
| Moisture | | 11.69 ± 0.20 | 25.33 ± 0.29 |
| Dry matter | | 88.31 ± 0.20 | 74.67 ± 0.30 |
| Dietary fiber% | | 8.34 ± 0.11 | 0.59 ± 0.04 |
| Protein% | | 1.72 ± 0.03 | 1.03 ± 0.07 |
| Lipids% | | 2.04 ± 0.05 | 2.33 ± 0.09 |
| Ash% | | 1.85 ± 0.06 | 1.71 ± 0.02 |
| Total sugar% | | 74.95 ± 0.15 | 65.09 ± 0.37 |
| Reducing sugars% | | 71.14 ± 0.08 | 61.35 ± 0.29 |
| Sugars | sucrose% | 1.93 ± 0.04 | 2.04 ± 0.07 |
| | glucose% | 33.68 ± 0.18 | 30.99 ± 0.70 |
| | fructose% | 31.22 ± 0.30 | 28.12 ± 0.20 |
| | glucose/fructose | 1.08 ± 0.01 | 1.11 ± 0.03 |

***Table 1:*** *Physico-chemical properties of date fleshand date syrup (Dibs).*

Values are expressed as the mean standard deviation of four determinations also in Table 1 illustrate the physico-chemical of date syrup (Dibs). It was found that the moisture content of dibs was 25.33% while, dry matter, dietary fiber, protein, lipids, ash, total sugar and reducing sugars contents of dibs were 74.67, 0.59, 1.03, 2.33, 1.71, 65.09 and 61.35%, respectively. The above data showed that total sugars and reducing sugars contents of the date syrup. As well as date syrup contained the low contents of fat, protein, ash and dietary fiber. These results are in agreement with previous studies (El-Nagga., *et al*. 2012). According to this study the major part of date syrup consisted of reducing sugars, fructose and glucose are the predominant sugars. These sugars have more advantages in comparison with sucrose (Sugar) on health since they are having higher sweetness (Ghafari., *et al*. 2013), which are easily absorbed by the human body. So, date syrup considered as a good and healthy replacement for sugar in processing of compote. These data are in same trend with those reported by (Raiesi Ardali., *et al*. 2014).

**Physiochemical composition of date compote fortification and replacement by different levels of milk and dibs**

Data tabulated in Table 2 shows the effect of fortification by milk, irrespective of replacement by dibs on chemical composition for date compote, i.e. total solids %, total dietary fibers %, total protein %, total lipids % and ash %. Results cleared that fortification level by milk had a significant effect on the all studied traits. The results revealed that increasing fortification of date compote by milk from zero to 25 and 50% of date weight led to an increase in total protein % of date compote by 39.79 and 79.03%, total lipids % of date compote by 30.72 and 55.56% and ash % of date compote by 9.82 and 18.30% of the control value (without or zero milk), respectively. This finding might be due to milk was a good source of protein and lipids, In contrast, Date flesh contained trace amounts of protein and lipids (Kaushik., et al. 2016). Also, results indicated that increasing quantity fortification of date compote by milk from zero to 25 and 50 % of date weight led to decrease in total solids % of date compote by 7.52 and 12.76 % as well as total dietary fibers of date compote by 3.37 and 4.01% and pH value of date compote by 3.63 and 7.74% of the control value (without or zero milk), respectively. This decrease in the previous traits might be attribute to milk was a poor source of dietary fibers. In contrast, milk contained moderate amounts of moisture.

| Indigenous | Milk Treatments | Treatments of Sugar Replacer | | | Mean ± SD |
|---|---|---|---|---|---|
| | | Zero dibs | 50 % dibs | 100% dibs | |
| Total solids% | Zero milk | 77.96 ± 0.72b | 79.48 ± 0.46a | 80.13 ± 0.246a | 79.19 ± 0.25a |
| | Milk 25% | 73.06 ± 0.84a | 73.86 ± 0.17a | 74.07 ± 0.18a | 73.65 ± 0.27b |
| | Milk 50% | 69.82 ± 0.76a | 70.20 ± 0.12ab | 70.97 ± 0.16a | 70.23 ± 0.34c |
| | Mean ± SD | 73.61 ± 0.33c | 74.49 ± 0.20b | 75.06 ± 0.06 | |
| Total Dietary fiber % | Zero | 6.88 ± 0.11a | 6.81 ± 0.13a | 6.53 ± 0.05b | 6.74 ± 0.05a |
| | Milk 25% | 6.68 ± 0.03a | 6.53 ± 0.06b | 6.35 ± 0.07c | 6.52 ± 0.05b |
| | Milk 50% | 6.66 ± 0.05a | 6.48 ± 0.03b | 6.31 ± 0.02c | 6.48 ± 0.03c |
| | Mean ± SD | 6.74 ± 0.02a | 6.61 ± 0.06b | 6.40 ± 0.04c | |
| Total protein % | Zero | 1.78 ± 0.03b | 1.84 ± 0.06b | 2.00 ± 0.05a | 1.86 ± 0.04c |
| | Milk 25% | 2.33 ± 0.27b | 2.55 ± 0.28ab | 2.93 ± 0.09a | 2.60 ± 0.19b |
| | Milk 50% | 3.05 ± 0.08c | 3.33 ± 0.12b | 3.60 ± 0.15a | 3.33 ± 0.11a |
| | Mean ± SD | 2.39 ± 0.10b | 2.57 ± 0.13b | 2.83 ± 0.10a | |
| Total lipids % | Zero | 1.49 ± 0.07a | 1.49 ± 0.06a | 1.60 ± 0.02a | 1.53 ± 0.03c |
| | Milk 25% | 1.87 ± 0.08b | 1.91 ± 0.04b | 2.21 ± 0.100a | 2.00 ± 0.04b |
| | Milk 50% | 2.08 ± 0.04c | 2.20 ± 0.05b | 2.85 ± 0.07a | 2.38 ± 0.04a |
| | Mean ± SD | 1.81 ± 0.03b | 1.87 ± 0.01b | 2.23 ± 0.05a | |

| | | | | | |
|---|---|---|---|---|---|
| Ash % | Zero | 1.91 ± 0.05c | 2.19 ± 0.07b | 2.61 ± 0.02a | 2.24 ± 0.01c |
| | Milk 25% | 2.09 ± 0.03c | 2.42 ± 0.12b | 2.86 ± 0.05a | 2.46 ± 0.05b |
| | Milk 50% | 2.23 ± 0.04c | 2.77 ± 0.08b | 2.94 ± 0.03a | 2.65 ± 0.02a |
| | Mean ± SD | 2.08 ± 0.01c | 2.46 ± 0.07b | 2.80 ± 0.04a | |
| pH value | Zero | 5.65 ± 0.05a | 5.35 ± 0.05b | 5.28 ± 0.03b | 5.43 ± 0.17a |
| | Milk 25% | 5.45 ± 0.05a | 5.17 ± 0.03b | 5.12 ± 0.03b | 5.24 ± 0.16b |
| | Milk 50% | 5.18 ± 0.03a | 5.03 ± 0.06b | 4.90 ± 0.10b | 5.04 ± 0.14c |
| | Mean ± SD | 5.43 ± 0.01a | 5.18 ± 0.02b | 5.10 ± 0.03c | |

***Table 2:*** *Effect of fortificationand replacementby different levels of milkand dibs onchemicalcomposition of datecompote.*

Values are expressed as the mean standard deviation of three determinations Data for the effect of replacement of sugar solution by dibs on chemical composition of date compote, irrespective of fortification by milk, are shown in Table 2. Results cleared that replaced dibs level had a significant effect on the all previous traits. The present results indicated that increasing replacement of dibs level from zero to 50 and 100% of sugar solution led to an increase in total solids % of date compote by 1.20 and 1.97%, total protein % of date compote by 7.53 and 18.41%, total lipids % by 3.32 and 23.20% and ash % by 18.27 and 34.62% of the control value (without or zero dibs), respectively. Also, results indicated that increasing quantity replacement of date compote by dibs from zero to 50 and 100% of date weight led to decrease in total dietary fibers by 1.97 and 5.31% and pH value of date compote by 4.83 and 6.47% of the control value (without or zero dibs), respectively. This result might be Date flesh was a good source of dietary fiber, in contrast, dibs contained trace amounts of total dietary fiber. These results are in the line with that reported by (Raiesi Ardali., *et al*. 2014).

| **Indigenous** | **Milk Treatments** | **Treatments of Sugar Replacer** | | | **Mean ± SD** |
|---|---|---|---|---|---|
| | | **Zero dibs** | **50 % dibs** | **100% dibs** | |
| Total sugars % | Zero milk | 66.95 ± 0.57c | 68.27 ± 0.56b | 70.28 ± 0.31a | 68.50 ± 0.07a |
| | Milk 25% | 62.24 ± 0.45c | 63.60 ± 0.28b | 64.99 ± 0.42a | 63.61 ± 0.20b |
| | Milk 50% | 59.46 ± 0.15c | 61.33 ± 0.32b | 62.21 ± 0.24a | 62.21 ± 0.24c |
| | Mean ± SD | 62.88 ± 0. 30c | 64.40 ± 0.06b | 65.82 ± 0.23a | |
| Reducing sugars % | Zero | 57.04 ± 0.23c | 59.56 ± 0.20bb | 62.65 ± 0.12a | 59.75 ± 0.08a |
| | Milk 25% | 53.84 ± 0.28c | 54.64 ± 0.24b | 57.08 ± 0.14a | 55.19 ± 0.16b |
| | Milk 50% | 51.68 ± 0.10b | 52.45 ± 0. 20b | 55.23 ± 0.78a | 53.12 ± 0.20c |
| | Mean ± SD | 54.19 ± 0.17c | 55.55 ± 0.09b | 58.32 ± 0.24a | |
| Sucrose % | Zero | 9.83 ± 0.12a | 4.59 ± 0.27b | 2.47 ± 0.27c | 5.63 ± 0.13a |
| | Milk 25% | 8.12 ± 0.06a | 4.09 ± 0.16b | 2.21 ± 0.12c | 4.81 ± 0.07b |
| | Milk 50% | 7.27 ± 0.15a | 3.88 ± 0.14b | 1.96 ± 0.08c | 4.37 ± 0.12c |
| | Mean ± SD | 8.41 ± 0.08a | 4.18 ± 0.18b | 2.21 ± 0.05c | |
| Glucose % | Zero | 23.98 ± 0.28c | 26.07 ± 0.06b | 28.59 ± 0.26a | 26.21 ± 0.17a |
| | Milk 25% | 22.47 ± 0.46c | 24.03 ± 0.43b | 25.62 ± 0.12a | 24.04 ± 0.29b |
| | Milk 50% | 20.46 ± 0.42c | 21.86 ± 0.10b | 23.39 ± 0.15a | 21.90 ± 0.22c |
| | Mean ± SD | 22.30 ± 0.26c | 23.99 ± 0.13b | 25.86 ± 0.11a | |

| | | | | | |
|---|---|---|---|---|---|
| Fructose % | Zero | 22.92 ± 0.27c | 23.95 ± 0.14b | 25.79 ± 0.11a | 24.22 ± 0.17a |
| | Milk 25% | 20.13 ± 0.40c | 21.83 ± 0.17b | 23.73 ± 0.30a | 21.80 ± 0.11b |
| | Milk 50% | 19.00 ± 0.19c | 19.78 ± 0.13b | 22.07 ± 0.09a | 20.28 ± 0.13c |
| | Mean ± SD | 20.69 ± 0.10c | 21.85 ± 0.05b | 23.86 ± 0.11a | |
| Glucose/ Fructose ratio | Zero | 1.05 ± 0.02b | 1.09 ± 0.01a | 1.11 ± 0.01a | 1.08 ± 0.01a |
| | Milk 25% | 1.12 ± 0.03a | 1.10 ± 0.01a | 1.08 ± 0.01b | 1.10 ± 0.01a |
| | Milk 50% | 1.08 ± 0.02ab | 1.11 ± 0.003a | 1.06 ± 0.01b | 1.08 ± 0.01a |
| | Mean ± SD | 1.08 ± 0.01b | 1.10 ± 0.003a | 1.08 ± 0.01b | |

***Table 3:*** *Effect of fortificationand replacementby different levels of milkand dibs on sugarscomposition of datecompote.*

Values are expressed as the mean standard deviation of three determinations Data tabulated in Table 3 shows the effect of fortification by milk, irrespective of replacement by dibs on sugars composition of date compote, i.e. total sugars %, reducing sugars %, sucrose %, glucose %, fructose % and glucose/fructose ratio. Results cleared that fortification level by milk had a significant effect on the all studied traits except glucose/fructose ratio. The data showed that increasing fortification of date compote by milk from zero to 25 and 50% led to decrease in total sugars of date compote by 10.11 to 7.69%; reducing sugars by 12.48 to 8.26%; sucrose by 28.83 to 17.05% and; glucose by 19.68 to 9.03% and fructose by 19.43 to 11.10% by comparison the control compote, respectively. This decrease in the previous traits might be attribute to milk was a weak source of total sugars (glucose and fructose) and sucrose. These findings are in the same line with those reported by (Guetouache., *et al*. 2014)

With regard to effect of replacement of sugar solution by dibs on chemical composition of date compote, irrespective of fortification by milk, are shown in Table 3. Data cleared that replaced dibs level had a significant effect on the all previous traits. The recorded data indicated that increasing replacement of dibs level from zero to 50 and 100% of sugar solution led to an increase in total sugars % of date compote by 2.42 and 4.68%, reducing sugars % of date compote increased by 2.51 and 7.62%, glucose % of date compote increased by 7.57 and 15.96% and fructose% of date compote increased by 5.61 and 15.32% of the control value (without or zero dibs), respectively. Also, results indicated that increasing quantity replacement of date compote by dibs from zero to 50 and 100% of date weight led to increase in sucrose% of date compote increased by 101.20 and 280.54%, respectively. This finding might be due to Date flesh and dibs was a good sources of total sugars, glucose and fructose contents, in contrast, date flesh and dibs contained little amounts of sucrose content, might be during the maturation process sucrose converted to glucose and fructose. These results are in the line with that reported by (El-Nagga., *et al*. El-Tawab 2012) and (Raiesi Ardali., *et al*. 014).

**Effect of fortification and replacement by different levels of milk and dibs on minerals composition of date compote**

Data presented in Table 4 demonstrated the effect of fortification by milk, irrespective of replacement by dibs on minerals composition of date compote, i.e. Potassium (K), Sodium (Na), Calcium (Ca), Magnesium (Mg) and Iron (Fe) contents (mg/100g). Results clarified that fortification level by milk had a significant effect on the all studied minerals. Data demonstrated that increasing fortification of date compote by milk from zero to 25 and 50% of date weight led to decrease in K content of date compote by 7.52 and 12.76% and Na content of date compote decreased by 8.54 and 4.01% of the control value (without or zero milk), respectively. In addition, data indicated that fortification of date compote by milk from zero to 25 and 50% of date weight led to an increase in Ca content of date compote by 39.79 and 79.03%; Mg content of date compote increased by 30.72 and 55.56% and Fe content of date compote increased by 9.82 and 18.30%, respectively. This increase in the previous traits might be attribute to that milk was a good source of Ca and Mg contents. These findings are in the same line with those reported by the obtained data are in close agreement that reported by (Soliman., et al. 2005).

| Minerals (mg/100g) | Milk Treatments | Treatments of Sugar Replacer | | | Mean ± SD |
|---|---|---|---|---|---|
| | | Zero dibs | 50% dibs | 100% dibs | |
| Potassium (K) | Zero milk | 77.96 ± 0.72b | 79.48 ± 0.46a | 80.13 ± 0.246a | 79.19 ± 0.25a |
| | Milk 25% | 73.06 ± 0.84a | 73.86 ± 0.17a | 74.07 ± 0.18a | 73.65 ± 0.27b |
| | Milk 50% | 69.82 ± 0.76a | 70.20 ± 0.12ab | 70.97 ± 0.16a | 70.23 ± 0.34c |
| | Mean ± SD | 73.61 ± 0.33c | 74.49 ± 0.20b | 75.06 ± 0.06 | |
| Sodium (Na) | Zero | 6.88 ± 0.11a | 6.81 ± 0.13a | 6.53 ± 0.05b | 6.74 ± 0.05a |
| | Milk 25% | 6.68 ± 0.03a | 6.53 ± 0.06b | 6.35 ± 0.07c | 6.21 ± 0.05b |
| | Milk 50% | 6.66 ± 0.05a | 6.48 ± 0.03b | 6.31 ± 0.02c | 6.48 ± 0.03c |
| | Mean ± SD | 6.74 ± 0.02a | 6.61 ± 0.06b | 6.40 ± 0.04c | |
| Calcium (Ca) | Zero | 1.78 ± 0.03b | 1.84 ± 0.06b | 2.00 ± 0.05a | 1.86 ± 0.04c |
| | Milk 25% | 2.33 ± 0.27b | 2.55 ± 0.28ab | 2.93 ± 0.09a | 2.60 ± 0.19b |
| | Milk 50% | 3.05 ± 0.08c | 3.33 ± 0.12b | 3.60 ± 0.15a | 3.33 ± 0.11a |
| | Mean ± SD | 2.39 ± 0.10b | 2.57 ± 0.13b | 2.83 ± 0.10a | |
| Magnesium (Mg) | Zero | 1.49 ± 0.07a | 1.49 ± 0.06a | 1.60 ± 0.02a | 1.53 ± 0.03c |
| | Milk 25% | 1.87 ± 0.08b | 1.91 ± 0.04b | 2.21 ± 0.100a | 2.00 ± 0.04b |
| | Milk 50% | 2.08 ± 0.04c | 2.20 ± 0.05b | 2.85 ± 0.07a | 2.38 ± 0.04a |
| | Mean ± SD | 1.81 ± 0.03b | 1.87 ± 0.01b | 2.23 ± 0.05a | |
| Iron (Fe) | Zero | 1.91 ± 0.05c | 2.19 ± 0.07b | 2.61 ± 0.02a | 2.24 ± 0.01c |
| | Milk 25% | 2.09 ± 0.03c | 2.42 ± 0.12b | 2.86 ± 0.05a | 2.46 ± 0.05b |
| | Milk 50% | 2.23 ± 0.04c | 2.77 ± 0.08b | 2.94 ± 0.03a | 2.65 ± 0.02a |
| | Mean ± SD | 2.08 ± 0.01c | 2.46 ± 0.07b | 2.80 ± 0.04a | |

***Table 4:*** *Effect of fortificationand replacementby different levels of milkand dibs on mineralscomposition (mg/100g) of datecompote.*

**Effect of fortification and replacement by different levels of milk and dibs on minerals composition (mg/100g) of date compote.**

Values are expressed as the mean standard deviation of three determinations regarding effect of replacement of sugar solution by dibs on minerals composition of date compote, irrespective of fortification by milk, was shown in Table 4. Data indicated that replaced dibs level had a significant effect on the all previous minerals. The found results showed that increasing replacement of dibs level from zero to 50 and 100% of sugar solution led to an increase in K content of date compote by 1.20 and 1.97%; Ca content of date compote increased by 7.53 and 18.41%; Mg content of date compote increased by 3.32 and 23.20% and Fe content of date compote increased by 18.27 and 34.62% of the control value (without or zero dibs), respectively. Also, results indicated that increasing quantity replacement of date compote by dibs from zero to 50 and 100% of date weight led to decrease in Na content of date compote by 1.97 and 5.31%, respectively. These increase in the previous traits might be attribute to that date flesh was a good source of Ca; Mg; K and Fe contents. The obtained data are in close agreement that reported by (Gad., *et al*. 2010). (El-Nagga., *et al*. 2012) and (Tang., *et al*. 2014) revealed that Saidy date flesh was a good source for many metals, such as K (1000 mg/100 g of fresh weight), Ca (28.5), Mg (52.0), Na (90.5), Zn (0.95) and Fe (10.0). They added that the date is considered as a practical supplement for iron rather than iron tablets for those who have iron deficiency because it does not show side effects.

**Effect of fortification and replacement by different levels of milk and dibs on essential and non- essential amino acids contents of date compote**

Data given in Tables 5 & 6 showed the effect of fortification by milk, irrespective of replacement by dibs on essential amino acids composition of date compote (histidine, isoleucine, leucine, lycine, methionine, phenylalanine tryptophan and valine) and non-essential amino acids composition of date compote, i.e. alanine, arginine, aspartic, cysteine, glutamic, proline, serine and tyrosine. Results indicated that fortification level by milk had a significant effect on the all studied essential and non-essential amino acids contents of date compote. Data demonstrated that increasing fortification of date compote by milk from zero to 25 and 50% of date weight led to increase in all studied essential and non-essential amino acids contents of date compote. This result might be attributed to that milk was a good source of essential and non-essential amino acids contents. These findings are in agreement with those reported by (Guetouache., *et al*. 2014).

| Essential amino acids | Milk Treatments | Treatments of sugar replacer | | | Mean ± SD |
|---|---|---|---|---|---|
| | | Zero dibs | 50% dibs | 100% dibs | |
| Histidine | Zero milk | 19.77 ± 0.39c | 20.91 ± 0.41b | 21.69 ± 0.17a | 20.79 ± 0.89c |
| | Milk 25% | 22.37 ± 0.17c | 22.83 ± 0.12b | 23.35 ± 0.12a | 22.85 ± 0.44b |
| | Milk 50% | 23.65 ± 0.17c | 23.99 ± 0.11b | 24.39 ± 0.16a | 24.01 ± 0.35a |
| | Mean ± SD | 21.93 ± 0.11c | 22.58 ± 0.13b | 23.14 ± 0.06a | |
| Isoleucine | Zero | 35.38 ± 0.46c | 37.26 ± 0.31b | 39.08 ± 0.43a | 37.24 ± 1.64c |
| | Milk 25% | 37.10 ± 0.23c | 38.48 ± 0.77b | 39.99 ± 0.72a | 38.52 ± 1.36b |
| | Milk 50% | 39.11 ± 0.37b | 39.42 ± 0.47b | 41.67 ± 0.16a | 40.07 ± 1.25a |
| | Mean ± SD | 37.20 ± 0.19c | 38.39 ± 0.13b | 40.25 ± 0.42a | |
| Leucine | Zero | 46.13 ± 0.29c | 47.21 ± 0.61b | 48.81 ± 0.48a | 47.39 ± 1.24c |
| | Milk 25% | 48.10 ± 0.18c | 49.61 ± 0.29b | 51.01 ± 0.19a | 49.57 ± 1.27b |
| | Milk 50% | 49.44 ± 0.18c | 51.44 ± 0.24b | 52.92 ± 0.49a | 51.27 ± 1.54a |
| | Mean ± SD | 47.89 ± 0.12c | 49.42 ± 0.19b | 50.91 ± 0.36a | |
| Lysine | Zero | 82.68 ± 0.98c | 84.40 ± 0.72b | 85.89 ± 0.32a | 84.32 ± 1.53c |
| | Milk 25% | 85.07 ± 0.25a | 86.29 ± 0.27a | 86.36 ± 1.70a | 85.91 ± 1.07b |
| | Milk 50% | 86.91 ± 0.17c | 88.90 ± 0.21b | 89.66 ± 0.38a | 88.49 ± 1.25a |
| | Mean ± SD | 84.89 ± 0.46c | 86.53 ± 0.24b | 87.30 ± 0.42a | |
| Methionine | Zero | 48.29 ± 0.35c | 50.25 ± 0.66b | 52.29 ± 0.36a | 50.27 ± 1.78c |
| | Milk 25% | 50.15 ± 0.43c | 50.99 ± 0.08b | 53.81 ± 0.51a | 51.65 ± 1.69b |
| | Milk 50% | 52.55 ± 0.76b | 52.55 ± 0.76b | 55.70 ± 0.50a | 53.60 ± 1.68a |
| | Mean ± SD | 50.33 ± 0.31c | 51.26 ± 0.28b | 53.93 ± 0.26a | |
| Phenylalanine | Zero | 41.23 ± 0.31c | 43.26 ± 0.28b | 44.57 ± 0.43a | 43.02 ± 1.49c |
| | Milk 25% | 43.37 ± 0.34c | 45.47 ± 0.27b | 47.02 ± 0.15a | 45.29 ± 1.60b |
| | Milk 50% | 45.95 ± 0.66b | 46.56 ± 0.20b | 48.24 ± 0.35a | 46.92 ± 1.10a |
| | Mean ± SD | 43.52 ± 0.22c | 45.10 ± 0.07b | 46.61 ± 0.19a | |
| Tryptophan | Zero | 38.86 ± 0.30c | 40.14 ± 0.40b | 41.39 ± 0.40a | 40.13 ± 1.14c |
| | Milk 25% | 40.11 ± 0.31c | 41.48 ± 0.14b | 42.99 ± 0.40a | 41.53 ± 1.28b |
| | Milk 50% | 41.37 ± 0.21c | 43.02 ± 0.07b | 45.30 ± 0.41a | 43.23 ± 1.72a |
| | Mean ± SD | 40.11 ± 0.23c | 41.54 ± 0.07b | 43.23 ± 0.12a | |

| | | | | | |
|---|---|---|---|---|---|
| Valine | Zero | 58.74 ± 0.58c | 60.23 ± 0.10b | 62.25 ± 0.39a | 60.41 ± 1.57c |
| | Milk 25% | 60.02 ± 0.31c | 62.96 ± 0.42b | 65.47 ± 0.25a | 62.82 ± 2.38b |
| | Milk 50% | 61.98 ± 0.14c | 65.28 ± 0.37b | 67.34 ± 0.35a | 64.87 ± 2.36a |
| | Mean ± SD | 60.25 ± 0.10c | 62.82 ± 0.12b | 65.02 ± 0.29a | |

***Table 5:*** *Effect of fortificationand replacementby different levels of milkand dibs on essentialaminoacids* of datecompote.*

**Effect of fortification and replacement by different levels of milk and dibs on essential amino acids* of date compote.**

Values are expressed as the mean standard deviation of three determinations. Amino acids were determined as mg/100g on dry weight basis. Concerning effect of replacement of sugar solution by dibs on essential amino acids composition of date compote (histidine, isoleucine, leucine, lycine, methionine, phenylalanine tryptophan and valine) and non-essential amino acids composition of date compote, i.e. alanine, arginine, aspartic, cysteine, glutamic, proline, serine and tyrosine. Results demonstrated that replaced dibs level had a significant effect on the all studied essential and non-essential amino acids contents of date compote except alanine, arginine and aspartic acids were no significant, irrespective of fortification by milk, are shown in Tables 5 & 6. The scored results showed that increasing replacement of dibs level from zero to 50 and 100% of sugar solution led to an increase in on the all studied essential and non-essential amino acids contents of date compote except alanine, arginine and aspartic acids. These results are in the same line with that reported by (Al-Farsi., *et al*. 2008) and (El-Sohaimy., *et al*. (2010).

| Essential amino acids | Milk Treatments | Treatments of Sugar Replacer | | | Mean ± SD |
|---|---|---|---|---|---|
| | | Zero Dibs | 50% Dibs | 100% Dibs | |
| Histidine | Zero milk | 19.77 ± 0.39c | 20.91 ± 0.41b | 21.69 ± 0.17a | 20.79 ± 0.89c |
| | Milk 25% | 22.37 ± 0.17c | 22.83 ± 0.12b | 23.35 ± 0.12a | 22.85 ± 0.44b |
| | Milk 50% | 23.65 ± 0.17c | 23.99 ± 0.11b | 24.39 ± 0.16a | 24.01 ± 0.35a |
| | Mean ± SD | 21.93 ± 0.11c | 22.58 ± 0.13b | 23.14 ± 0.06a | |
| Isoleucine | Zero | 35.38 ± 0.46c | 37.26 ± 0.31b | 39.08 ± 0.43a | 37.24 ± 1.64c |
| | Milk 25% | 37.10 ± 0.23c | 38.48 ± 0.77b | 39.99 ± 0.72a | 38.52 ± 1.36b |
| | Milk 50% | 39.11 ± 0.37b | 39.42 ± 0.47b | 41.67 ± 0.16a | 40.07 ± 1.25a |
| | Mean ± SD | 37.20 ± 0.19c | 38.39 ± 0.13b | 40.25 ± 0.42a | |
| Leucine | Zero | 46.13 ± 0.29c | 47.21 ± 0.61b | 48.81 ± 0.48a | 47.39 ± 1.24c |
| | Milk 25% | 48.10 ± 0.18c | 49.61 ± 0.29b | 51.01 ± 0.19a | 49.57 ± 1.27b |
| | Milk 50% | 49.44 ± 0.18c | 51.44 ± 0.24b | 52.92 ± 0.49a | 51.27 ± 1.54a |
| | Mean ± SD | 47.89 ± 0.12c | 49.42 ± 0.19b | 50.91 ± 0.36a | |
| Lysine | Zero | 82.68 ± 0.98c | 84.40 ± 0.72b | 85.89 ± 0.32a | 84.32 ± 1.53c |
| | Milk 25% | 85.07 ± 0.25a | 86.29 ± 0.27a | 86.36 ± 1.70a | 85.91 ± 1.07b |
| | Milk 50% | 86.91 ± 0.17c | 88.90 ± 0.21b | 89.66 ± 0.38a | 88.49 ± 1.25a |
| | Mean ± SD | 84.89 ± 0.46c | 86.53 ± 0.24b | 87.30 ± 0.42a | |
| Methionine | Zero | 48.29 ± 0.35c | 50.25 ± 0.66b | 52.29 ± 0.36a | 50.27 ± 1.78c |
| | Milk 25% | 50.15 ± 0.43c | 50.99 ± 0.08b | 53.81 ± 0.51a | 51.65 ± 1.69b |
| | Milk 50% | 52.55 ± 0.76b | 52.55 ± 0.76b | 55.70 ± 0.50a | 53.60 ± 1.68a |
| | Mean ± SD | 50.33 ± 0.31c | 51.26 ± 0.28b | 53.93 ± 0.26a | |

| | | | | | |
|---|---|---|---|---|---|
| Phenylalanine | Zero | 41.23 ± 0.31c | 43.26 ± 0.28b | 44.57 ± 0.43a | 43.02 ± 1.49c |
| | Milk 25% | 43.37 ± 0.34c | 45.47 ± 0.27b | 47.02 ± 0.15a | 45.29 ± 1.60b |
| | Milk 50% | 45.95 ± 0.66b | 46.56 ± 0.20b | 48.24 ± 0.35a | 46.92 ± 1.10a |
| | Mean ± SD | 43.52 ± 0.22c | 45.10 ± 0.07b | 46.61 ± 0.19a | |
| Tryptophan | Zero | 38.86 ± 0.30c | 40.14 ± 0.40b | 41.39 ± 0.40a | 40.13 ± 1.14c |
| | Milk 25% | 40.11 ± 0.31c | 41.48 ± 0.14b | 42.99 ± 0.40a | 41.53 ± 1.28b |
| | Milk 50% | 41.37 ± 0.21c | 43.02 ± 0.07b | 45.30 ± 0.41a | 43.23 ± 1.72a |
| | Mean ± SD | 40.11 ± 0.23c | 41.54 ± 0.07b | 43.23 ± 0.12a | |
| Valine | Zero | 58.74 ± 0.58c | 60.23 ± 0.10b | 62.25 ± 0.39a | 60.41 ± 1.57c |
| | Milk 25% | 60.02 ± 0.31c | 62.96 ± 0.42b | 65.47 ± 0.25a | 62.82 ± 2.38b |
| | Milk 50% | 61.98 ± 0.14c | 65.28 ± 0.37b | 67.34 ± 0.35a | 64.87 ± 2.36a |
| | Mean ± SD | 60.25 ± 0.10c | 62.82 ± 0.12b | 65.02 ± 0.29a | |

***Table 6:*** *Effect of fortificationand replacementby different levels of milkand dibs on non-essentialaminoacids* of datecompote.*

**Effect of fortification and replacement by different levels of milk and dibs on non-essential amino acids* of date compote.**

Values are expressed as the mean standard deviation of three determinations

Amino acids were determined as mg/100g on dry weight basis

**Effect of fortification and replacement by different levels of milk and dibs on sensory evaluation of date compote**

Results given in Table 7 showed the effect of fortification by milk, irrespective of replacement by dibs on sensory evaluation of date compote (flavour, appearance, taste, and consistency). Data pointed out that fortification level by milk had a significant effect on the all studied sensory evaluation properties of date compote. Data indicated that increasing fortification of date compote by milk from zero to 25 and 50% of date weight led to increase in flavor of date compote by 5.60 and 9.17%; appearance of date compote by 13.74 and 14.38%; taste of date compote by 2.36 and 4.98% and consistency of date compote by 3.52 and 6.36% of the control value (zero or without milk). The highest increase in the sensory evaluation of date compote was recorded for the appearance of product. This result might be attributed to that colour of milk is white. These findings are in the same line with those reported by (Barłowska., *et al*. 2011).

Regarding effect of replacement of sugar solution by dibs on sensory evaluation of date compote, irrespective of fortification by milk, are shown in Table 7. Data indicated that replaced dibs level had a significant effect on the all studied sensory evaluation properties, i.e. flavor, appearance, taste and consistency. The found results showed that increasing replacement of dibs level from zero to 100% of sugar solution led to an increase in flavour by 10.11 to 15.78%; taste by 19.97 to 25.42%; consistency by 2.60 to 5.19% to control compote (without or zero dibs) to dibs compote, respectively. This increase in the previous traits might be attribute to those dibs was a good source of total sugars and especially fructose content. Also, results indicated that increasing quantity replacement of date compote by dibs from zero to 100% of date weight led to decrease in appearance of date compote by 5.95%, to 1.75, respectively. This result might be expected due to the colour of dibs is brownish. The obtained data are in agreement with those reported by (Soliman GZ., et al. 2005). Comparison of chemical and mineral content of milk from human, cow, buffalo, camel and goat in Egypt. The Egyptian Journal of Hospital Medicine, 21:116–130.

| Property | MILK Concentrate | Treatments of Sugar Replacer | | | Mean ± SD |
|---|---|---|---|---|---|
| | | Zero dibs | 50% dibs | 100% dibs | |
| Flavour (10) | Zero | 7.63 ± 0.15c | 8.50 ± 0.10b | 9.07 ± 0.06a | 8.40 ± 0.63c |
| | Milk 25% | 8.17 ± 0.06c | 8.97 ± 0.06b | 9.47 ± 0.06a | 8.87 ± 0.57b |
| | Milk 50% | 8.53 ± 0.06c | 9.33 ± 0.06b | 9.63 ± 0.06a | 9.17 ± 0.49a |
| | Mean ± SD | 8.11 ± 0.05c | 8.93 ± 0.07b | 9.39 ± 0.02a | |
| Appearance (10) | Zero | 8.10 ± 0.10a | 7.73 ± 0.06b | 7.53 ± 0.06c | 7.79 ± 0.26b |
| | Milk 25% | 8.67 ± 0.06b | 9.17 ± 0.06a | 8.73 ± 0.06b | 8.86 ± 0.24a |
| | Milk 50% | 9.43 ± 0.06 a | 8.83 ± 0.06b | 8.47 ± 0.06c | 8.91 ± 0.43a |
| | Mean ± SD | 8.73 ± 0.07a | 8.58 ± 0.02b | 8.24 ± 0.02c | |
| Taste (10) | Zero | 7.40 ± 0.10c | 8.13 ± 0.06b | 8.60 ± 0.10a | 8.04 ± 0.53c |
| | Milk 25% | 7.13 ± 0.06c | 8.60 ± 0.10b | 8.97 ± 0.06a | 8.23 ± 0.84b |
| | Milk 50% | 6.93 ± 0.12c | 9.03 ± 0.06b | 9.37 ± 0.06a | 8.44 ± 1.14a |
| | Mean ± SD | 7.16 ± 0.05c | 8.59 ± 0.07b | 8.98 ± 0.07a | |
| Consistency (10) | Zero | 8.57 ± 0.06c | 8.77 ± 0.06b | 9.07 ± 0.06b | 8.80 ± 0.22c |
| | Milk 25% | 8.87 ± 0.06c | 9.13 ± 0.06b | 9.33 ± 0.06a | 9.11 ± 0.21b |
| | Milk 50% | 9.13 ± 0.06c | 9.37 ± 0.06b | 9.57 ± 0.06a | 9.36 ± 0.19a |
| | Mean ± SD | 8.86 ± 0.05c | 9.09 ± 0.02b | 9.32 ± 0.02a | |
| Overall acceptance (40) | Zero | 31.70 ± 0.30c | 33.13 ± 0.06b | 34.27 ± 0.06a | 33.03 ± 1.12c |
| | Milk 25% | 32.83 ± 0.06c | 35.87 ± 0.23b | 36.50 ± 0.00a | 35.07 ± 1.70b |
| | Milk 50% | 34.03 ± 0.06c | 36.57 ± 0.15b | 37.03 ± 0.21a | 35.88 ± 1.40a |
| | Mean ± SD | 32.86 ± 0.12c | 35.19 ± 0.10b | 35.93 ± 0.06a | |
| Property | MILK Concentrate | Treatments of sugar replacer | | | Mean ± SD |
| | | Zero dibs | 50% dibs | 100% dibs | |
| Flavour (10) | Zero | 7.63 ± 0.15c | 8.50 ± 0.10b | 9.07 ± 0.06a | 8.40 ± 0.63c |
| | Milk 25% | 8.17 ± 0.06c | 8.97 ± 0.06b | 9.47 ± 0.06a | 8.87 ± 0.57b |
| | Milk 50% | 8.53 ± 0.06c | 9.33 ± 0.06b | 9.63 ± 0.06a | 9.17 ± 0.49a |
| | Mean ± SD | 8.11 ± 0.05c | 8.93 ± 0.07b | 9.39 ± 0.02a | |
| Appearance (10) | Zero | 8.10 ± 0.10a | 7.73 ± 0.06b | 7.53 ± 0.06c | 7.79 ± 0.26b |
| | Milk 25% | 8.67 ± 0.06b | 9.17 ± 0.06a | 8.73 ± 0.06b | 8.86 ± 0.24a |
| | Milk 50% | 9.43 ± 0.06 a | 8.83 ± 0.06b | 8.47 ± 0.06c | 8.91 ± 0.43a |
| | Mean ± SD | 8.73 ± 0.07a | 8.58 ± 0.02b | 8.24 ± 0.02c | |
| Taste (10) | Zero | 7.40 ± 0.10c | 8.13 ± 0.06b | 8.60 ± 0.10a | 8.04 ± 0.53c |
| | Milk 25% | 7.13 ± 0.06c | 8.60 ± 0.10b | 8.97 ± 0.06a | 8.23 ± 0.84b |
| | Milk 50% | 6.93 ± 0.12c | 9.03 ± 0.06b | 9.37 ± 0.06a | 8.44 ± 1.14a |
| | Mean ± SD | 7.16 ± 0.05c | 8.59 ± 0.07b | 8.98 ± 0.07a | |
| Consistency (10) | Zero | 8.57 ± 0.06c | 8.77 ± 0.06b | 9.07 ± 0.06b | 8.80 ± 0.22c |
| | Milk 25% | 8.87 ± 0.06c | 9.13 ± 0.06b | 9.33 ± 0.06a | 9.11 ± 0.21b |
| | Milk 50% | 9.13 ± 0.06c | 9.37 ± 0.06b | 9.57 ± 0.06a | 9.36 ± 0.19a |
| | Mean ± SD | 8.86 ± 0.05c | 9.09 ± 0.02b | 9.32 ± 0.02a | |

| | | | | | |
|---|---|---|---|---|---|
| Overall acceptance (40) | Zero | 31.70 ± 0.30c | 33.13 ± 0.06b | 34.27 ± 0.06a | 33.03 ± 1.12c |
| | Milk 25% | 32.83 ± 0.06c | 35.87 ± 0.23b | 36.50 ± 0.00a | 35.07 ± 1.70b |
| | Milk 50% | 34.03 ± 0.06c | 36.57 ± 0.15b | 37.03 ± 0.21a | 35.88 ± 1.40a |
| | Mean ± SD | 32.86 ± 0.12c | 35.19 ± 0.10b | 35.93 ± 0.06a | |
| Property | MILK concentrate | Treatments of sugar replacer | | | Mean ± SD |
| | | Zero dibs | 50% dibs | 100% dibs | |
| Flavour (10) | Zero | 7.63 ± 0.15c | 8.50 ± 0.10b | 9.07 ± 0.06a | 8.40 ± 0.63c |
| | Milk 25% | 8.17 ± 0.06c | 8.97 ± 0.06b | 9.47 ± 0.06a | 8.87 ± 0.57b |
| | Milk 50% | 8.53 ± 0.06c | 9.33 ± 0.06b | 9.63 ± 0.06a | 9.17 ± 0.49a |
| | Mean ± SD | 8.11 ± 0.05c | 8.93 ± 0.07b | 9.39 ± 0.02a | |
| Appearance (10) | Zero | 8.10 ± 0.10a | 7.73 ± 0.06b | 7.53 ± 0.06c | 7.79 ± 0.26b |
| | Milk 25% | 8.67 ± 0.06b | 9.17 ± 0.06a | 8.73 ± 0.06b | 8.86 ± 0.24a |
| | Milk 50% | 9.43 ± 0.06 a | 8.83 ± 0.06b | 8.47 ± 0.06c | 8.91 ± 0.43a |
| | Mean ± SD | 8.73 ± 0.07a | 8.58 ± 0.02b | 8.24 ± 0.02c | |
| Taste (10) | Zero | 7.40 ± 0.10c | 8.13 ± 0.06b | 8.60 ± 0.10a | 8.04 ± 0.53c |
| | Milk 25% | 7.13 ± 0.06c | 8.60 ± 0.10b | 8.97 ± 0.06a | 8.23 ± 0.84b |
| | Milk 50% | 6.93 ± 0.12c | 9.03 ± 0.06b | 9.37 ± 0.06a | 8.44 ± 1.14a |
| | Mean ± SD | 7.16 ± 0.05c | 8.59 ± 0.07b | 8.98 ± 0.07a | |
| Consistency (10) | Zero | 8.57 ± 0.06c | 8.77 ± 0.06b | 9.07 ± 0.06b | 8.80 ± 0.22c |
| | Milk 25% | 8.87 ± 0.06c | 9.13 ± 0.06b | 9.33 ± 0.06a | 9.11 ± 0.21b |
| | Milk 50% | 9.13 ± 0.06c | 9.37 ± 0.06b | 9.57 ± 0.06a | 9.36 ± 0.19a |
| | Mean ± SD | 8.86 ± 0.05c | 9.09 ± 0.02b | 9.32 ± 0.02a | |
| Overall acceptance (40) | Zero | 31.70 ± 0.30c | 33.13 ± 0.06b | 34.27 ± 0.06a | 33.03 ± 1.12c |
| | Milk 25% | 32.83 ± 0.06c | 35.87 ± 0.23b | 36.50 ± 0.00a | 35.07 ± 1.70b |
| | Milk 50% | 34.03 ± 0.06c | 36.57 ± 0.15b | 37.03 ± 0.21a | 35.88 ± 1.40a |
| | Mean ± SD | 32.86 ± 0.12c | 35.19 ± 0.10b | 35.93 ± 0.06a | |
| Property | MILK concentrate | Treatments of sugar replacer | | | Mean ± SD |
| | | Zero dibs | 50% dibs | 100% dibs | |
| Flavour (10) | Zero | 7.63 ± 0.15c | 8.50 ± 0.10b | 9.07 ± 0.06a | 8.40 ± 0.63c |
| | Milk 25% | 8.17 ± 0.06c | 8.97 ± 0.06b | 9.47 ± 0.06a | 8.87 ± 0.57b |
| | Milk 50% | 8.53 ± 0.06c | 9.33 ± 0.06b | 9.63 ± 0.06a | 9.17 ± 0.49a |
| | Mean ± SD | 8.11 ± 0.05c | 8.93 ± 0.07b | 9.39 ± 0.02a | |
| Appearance (10) | Zero | 8.10 ± 0.10a | 7.73 ± 0.06b | 7.53 ± 0.06c | 7.79 ± 0.26b |
| | Milk 25% | 8.67 ± 0.06b | 9.17 ± 0.06a | 8.73 ± 0.06b | 8.86 ± 0.24a |
| | Milk 50% | 9.43 ± 0.06 a | 8.83 ± 0.06b | 8.47 ± 0.06c | 8.91 ± 0.43a |
| | Mean ± SD | 8.73 ± 0.07a | 8.58 ± 0.02b | 8.24 ± 0.02c | |
| Taste (10) | Zero | 7.40 ± 0.10c | 8.13 ± 0.06b | 8.60 ± 0.10a | 8.04 ± 0.53c |
| | Milk 25% | 7.13 ± 0.06c | 8.60 ± 0.10b | 8.97 ± 0.06a | 8.23 ± 0.84b |
| | Milk 50% | 6.93 ± 0.12c | 9.03 ± 0.06b | 9.37 ± 0.06a | 8.44 ± 1.14a |
| | Mean ± SD | 7.16 ± 0.05c | 8.59 ± 0.07b | 8.98 ± 0.07a | |

| | | | | | |
|---|---|---|---|---|---|
| Consistency (10) | Zero | 8.57 ± 0.06c | 8.77 ± 0.06b | 9.07 ± 0.06b | 8.80 ± 0.22c |
| | Milk 25% | 8.87 ± 0.06c | 9.13 ± 0.06b | 9.33 ± 0.06a | 9.11 ± 0.21b |
| | Milk 50% | 9.13 ± 0.06c | 9.37 ± 0.06b | 9.57 ± 0.06a | 9.36 ± 0.19a |
| | Mean ± SD | 8.86 ± 0.05c | 9.09 ± 0.02b | 9.32 ± 0.02a | |
| Overall acceptance (40) | Zero | 31.70 ± 0.30c | 33.13 ± 0.06b | 34.27 ± 0.06a | 33.03 ± 1.12c |
| | Milk 25% | 32.83 ± 0.06c | 35.87 ± 0.23b | 36.50 ± 0.00a | 35.07 ± 1.70b |
| | Milk 50% | 34.03 ± 0.06c | 36.57 ± 0.15b | 37.03 ± 0.21a | 35.88 ± 1.40a |
| | Mean ± SD | 32.86 ± 0.12c | 35.19 ± 0.10b | 35.93 ± 0.06a | |

***Table 7:*** *Sensory evaluation ofcompote fortifiedby differentconcentrates of milk.*

## Conclusion

Milk is having high nutritive value as it contains fat and water soluble vitamins, minerals, proteins and lipids. Date fruits are considered as a good source of sugars, minerals and other substances. Also, Date syrup characterized with its higher calories, vitamins and minerals; Combination of them in date compote provides a highly nutritive product with benefits to gather. The recorded results in this work indicated that date compote supported by milk at 50% of date weight as source for the fat and protein and dibs at 100 % of date weight as an alternative to sugar solution is the best, highly nutritious and economically cheap. (Amiri., et al. 2014) for yoghourt incorporation by date palm paste and ice cream fortified with dibs.

## Reference

1. Abbes F., *et al*. "Effect of processing conditions on phenolic compounds & antioxidant properties of date syrup". *Industrial crop & product* 44 (2013): 634-642.
2. Al-Farsi M., *et al*. "Nutritional and Functional Properties of Dates: A Review". *Food Science & Nutrition* (2008): 48:877-87.
3. Al-Farsi M., *et al*. "Compositional and functional characteristics of dates, syrups, and their by-products". *Food Chemistry* 104 (2007): 943-947.
4. Al-Hooti S., *et al*. "Physicochemical characteristics of five date fruit cultivars grown in the United ArabEmirates, Plant Foods Hum". *Nutrition Journal* 50 (1997): 101–113.
5. Al-Shahib, W., *et al*. "The fruit of the date: it's possible as the best food for the future". *International Journal of Food Sciences and Nutrition* 54 (2003): 247-259.
6. Amiri HS., *et al*. "Effect of date syrup as a substitute for Sugar on physicochemical and sensory properties of ice cream". *International Journal of Biosciences* 5 (2014): 80-88.
7. AOAC "Official Methods of Analysis of Association of Official Analytical Chemist International, Washington (D.C.)". (2005).
8. Assirey EAR. "Nutritional composition of fruit of 10 date palm (Phoenix dactylifera L.) cultivars grown in Saudi Arabia". *Journal of Taibah University for Science* 9(2015): 75–79.
9. Barłowska J., *et al*. "Nutritional Value and Technological Suitability of Milk from Various Animal Species Used for Dairy Production". *Food Science and Food Safety* 10: 291-302.
10. Besbes S., *et al*. "Adding value to hard date (Phoenix dacty¬lifera L.): Compositional, functional and sensory characteristics of date jam". *Food Chemistry* 112 (2009): 406–411.
11. Borchani C., *et al*. "Chemical properties of 11 date cultivars and their corresponding fiber extracts". *African Journal of Biotechnology* 9 (2010): 4096-4105.
12. El-Nagga EA., *et al*. "Compositional characteristics of date syrup extracted by different methods in some fermented dairy products". *Annals of Agricultural Sciences* 57 (2012): 29–36.

13. El-Sharnouby A., *et al*. "Utilization of enzymes in the production of liquid sugar from dates". *African Journal of Biochemistry Research* 3.3 (2009): 41-47.
14. El-Sohaimy SA., *et al*. "Biochemical and Nutritional Characterizations of Date Palm Fruits (*Phoenix dactylifera* L.)". *Journal of applied sciences research* 6 (2010): 1060-1067.
15. "FAO Food and Agriculture Organization of United Nations, Date palm production chapter 1 & 2 downloaded from FAO website (2017)".
16. Gad AS. "Evaluation of the nutritional value of functional yogurt resulting from combination of date palm syrup & skim milk". *American Journal of Food Technology* 5 (2017): 250-259.
17. GhafariZ., *et al*. "Use of date syrup as a sweetener in nonalcoholic beer: sensory & rheological assessment". *International peer-reviewed scientific online journal* 3 (2012): 182 -184.
18. Guetouache., *et al*. "Composition and nutritional value of raw milk". *Issues in Biological Sciences and Pharmaceutical Research* 2 (2014): 115-122.
19. Hasnaoui A., *et al*. "Physico- chemical characterization and associated antioxidant capacity of fiber concentrates from Moroccan date flesh". *Indian Journal of Science and Technology* 5 (2012): 2954- 2960.
20. Ishurd O., *et al*. "The anticancer activity of polysacharide prepared from Libyan dates (Phoenix dactylifera L.)". *Carbohydrate. Polymer* 59 (2005): 531-535.
21. Ismail MM. "Which Is Better for Humans, Animal Milk or Vegetable Milk". *Journal of Food Engineering, Nutrition Journal* 2.67 (2015).
22. Kaushik M., *et al*. "Studies on Preparation of Rabri using Date Syrup as Sugar Substitute". *International Journal of Science and Research* 5 (2016): 1183-1188.
23. Khan M., *et al*. "Physio-chemical characterization of date varieties using multivariate analysis. Journal of Agricultural and Food Chemistry 88 (2016): 1051–1059.
24. Miguel A., *et al*. "Total and soluble contents of calcium, magnesium, phosphorus and zinc in yoghurts". *Food Chemistry* 80 (2003): 573-578.
25. Raiesi Ardali F., *et al*. "Production of a new drink by using date syrup and milk". *Journal of Food Biosciences and Technology* 4 (2003): 67-72.
26. Ranganna S. "Handbook of analysis and quality control for fruit and vegetable products". 2nd Edition - Juniorun New Delhi 2017 2nd Edition (1986).
27. Rofehgari-Nejad L., *et al*. "Comparative study of date syrup decolourization efficiency with ion exchange resins & bone chart". *Asian Journal of Chemistry* 22 (2010): 16-20.
28. Shafiei M., *et al*. "Palm Date Fibers: Analysis and Enzymatic Hydrolysis". *International Journal of Molecular Sciences* 11 (2010): 4285-4296.
29. Soliman GZA. "Comparison of chemical and mineral content of milk from human, cow, buffalo, camel and goat in Egypt". *The Egyptian Journal of Hospital Medicine* 21 (2005): 116-130.
30. Tang ZX., *et al*. "Date and their processing byproducts as substrates for bioactive compounds production". *Brazilian Archives of Biology and Technology* 57 (2014): 706-713.