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# The Sensory Evaluation of Frozen Yoghurt Supplemented by Using Different Concentration of Date Pulp

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**Abstract**

*The objective was carried out to develop improved frozen yoghurt with best combination of date pulp and determine the effect of Total four combination of milk and date pulp (96:4, 94 :6,92:8,90:10) on sensory evaluation and overall acceptability was satisfactory blended to yoghurt cultures i.e. Streptococcus salivarius ssp. thermophilus NCDC074, and Lactobacillus delbrueckii ssp. bulgaricus MCDC009 following by incubation at 40$^0$C for 3-4 hours. Control frozen yoghurt mix was standardized to 5% milk fat, solid not fat 11%, sugar 12%, stabilizer and emulsifier 0.3%.*

**Keywords:** Frozen yoghurt , Date pulp , sensory quality, Yoghurt culture.

## 1- Introduction

Frozen yoghurt dessert can be regarded as a healthy alternative to ice cream for people suffering from obesity, cardiovascular diseases and lactose intolerance due to its low fat content (the fat percentage of regular frozen yoghurt ranges from 3.5% to 6%) **Marshall *et al* ( 2003).** Frozen yoghurt with best combination of date pulp and conducted with the possibility of developing a dairy product with health benefits beyond those of traditionally formulated for food providing benefit beyond nutrition **Mahdi and R. Chandra (2014).**

Yoghurt is a cultured milk product and generally fermented with mixture of two species i.e. *Lactobacillus bugaricus* and *Streptococcus thermophilus*. Usually it contains 12-14 per cent total milk solids and has soft, friable custard like consistency and a clean distinct acid flavor. Yoghurt supplies high quality of protein and is excellent source of calcium, phosphorus and potassium and contains significant quantities of general vitamins. Yoghurt could be used for infant and adult feeding owing to its higher Ca/Na ratio as compared to RDA value in USA **Demott (1985).**

Yoghurt is an increasingly popular cultured dairy product in most countries. This is partly because of an increased awareness of consumers regarding possible health benefits of yoghurt. Yoghurt is easily digested, has high nutritional value and is a rich source of carbohydrates, protein, fat, vitamins, calcium and phosphorus. As milk protein, fat and lactose components undergo partial hydrolysis during fermentation, yoghurt is an easily digested product of milk **Rasic and Kurman (1978)** and **Tamime and Rabinson (1983).**

Date varieties have been developed by thousands of years of selection of seedlings and only those possessing desirable characteristics have been propagated. Most commonly grown dates variety are Berhi, Dayri, Deglet, Noor, Halawy, Khadrawy SafriSayer. Date varieties can be grouped into three types. 1) Soft type dates have a soft flesh, high moisture content (17-22%) and relatively low sugar content. 2) Semi-dry varieties have a firm flesh, fairly low moisture content (11-16%) and high sugar content. 3) Dry dates have high sugar content, very low moisture content (8-10%), and a dry, hard flesh. Most of UAE date varieties are of the soft type. Date fruits offer a good source of high nutritive value (3000 calories/Kg). Khalal (Balah or Biser) is hard and crisp, yellow or red, with moisture content of about 50 per cent and it is perishable **Jaradat** and **Zaid (2004).**

Probiotics play a major role in health and wellbeing beyond basic nutrition **Vanaja *et al.* (2011)**.

Date syrup is considered to have functional properties such as the ability to act as a sugar replacer. Most of the carbohydrates in dates are in the form of fructose and glucose, which are easily absorbed by the human body **Al-Farsi *et al.* (2005).**

The production of fermented milk products is increasing rapidly in all the major developing countries of the world. An important constituent of food is fat that serves as rich source of energy and contributes to various sensory and rheological characteristics. These attributes contributes to the richness of the product for better market value and consumer acceptability. However, consumption of diet high in animal fat is associated with incidence of obesity, coronary heart disease, hypertension, insulin resistance and cancer and gall bladder diseases. Hence, there is a demand for low fat and low energy foods **Swanson (1998)**.

The addition of protein in foods alters many of the physic-chemical and functional properties. Frozen yoghurt is a unique way of combining the

characteristics of ice cream and the therapeutic character of yoghurt. Fruit yoghurt contain significantly lower amount of fat, protein and minerals than plain yoghurt **Desai and Toro (1994).**

## 2- Material And Methods

The experiment"Studies 0n preparation of frozen yoghurt with Incorporation of Date pulp "Was conducted in the student Research Lab Warner School of Food and Dairy Technology ,Sam Higginbottom Institute of Agriculture ,Technology &Sciences (Deemed to be University).

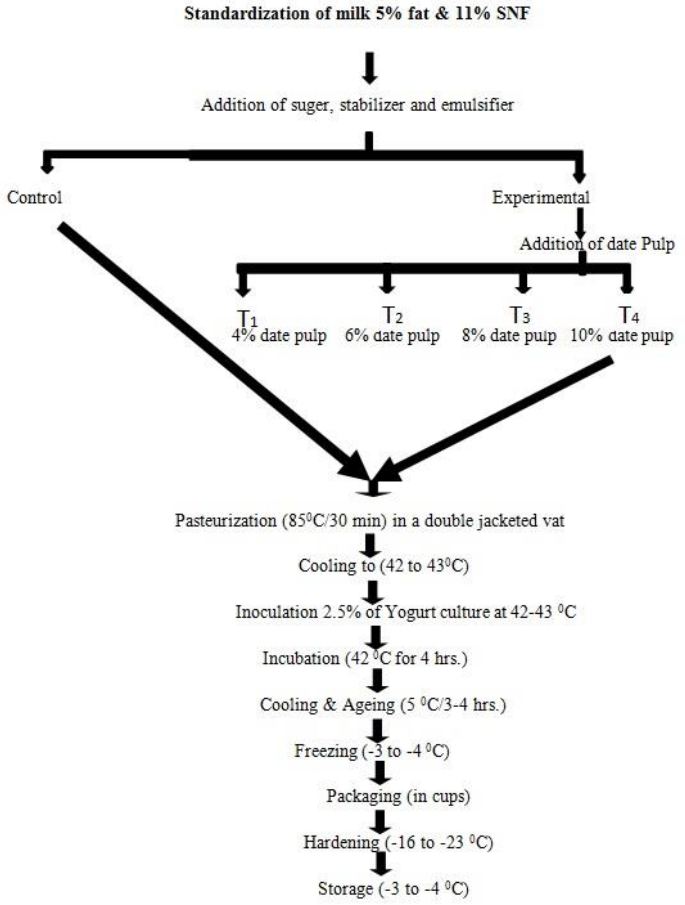
### Material required

**Yoghurt culture**- *Streptococcus salivarius ssp. thermophilus* NCDC074, and *Lactobacillus delbrueckii ssp. bulgaricus* MCDC009 were obtained from National Collection of Dairy Culture , Dairy Microbiology division at NDRI, Karnal-Haryna-india.
**Date pulp** (type khstawi) –from local market of Allahabad **.**
**Milk**–from local market of Allahabad.
**Sugar**–from local market of Allahabad.
**Stabilizer** and **Emulsifiers**–from scientific cooperation, Allahabad**.**

### Treatment Combination

1. $T_0$ Frozen yoghurt prepared from milk standardized to 5% fat and 11% milk SNF with the addition of 12% sugar, 0.3% of stabilizer and emulsifiers.
2. $T_1$ Frozen yoghurt prepared from milk standardized to 5% fat and 11% milk SNF with the addition of 12% sugar, 0.3% of stabilizer and emulsifiers, incorporated with 4% date pulp.
3. $T_2$ Frozen yoghurt prepared from milk standardized to 5% fat and 11% milk SNF with the addition of 12% sugar, 0.3% of stabilizer and emulsifiers, incorporated with 6% date pulp.
4. $T_3$ Frozen yoghurt prepared from milk standardized to 5% fat and 11% milk SNF with the addition of 12% sugar, 0.3% of stabilizer and emulsifiers, incorporated with 8%date pulp.
5. T4 Frozen yoghurt prepared from milk standardized to 5% fat and 11% milk SNF with the addition of 12% sugar, 0.3% of stabilizer and emulsifiers, incorporated with 10% date pulp.

**Fig: Process Flow chart for Control and Experimental Frozen Yoghurt.**




## Result and Discussion

## Results

| Parameters | Treatments | | | | |
|---|---|---|---|---|---|
| | **T0** | **T1** | **T2** | **T3** | **T4** |
| **Organoleptic Analysis** | | | | | |
| **Flavour and Taste** | 7.20 | 7.60 | 7.80 | 8.40 | 8.60 |
| **Body and Texture** | 7.40 | 8.00 | 7.80 | 7.60 | 7.20 |
| **Colour and Appearance** | 8.00 | 8.20 | 7.80 | 8.40 | 8.60 |
| **Overall Acceptability** | 7.53 | 7.93 | 7.79 | 8.13 | 8.13 |

**Flavour and Taste:**

The meant flavor and taste percentage in samples of date pulp frozen yoghurt samples was noted that highest mean flavor and taste personage was recorded in the date pulp frozen yoghurt sample of $T_4$ (8.60) followed by $T_3$ (8.40) followed by $T_2$ (7.80) followed by $T_1$ (7.60)followed by $T_0$ (7.20). However the differences in these values were found significant indicating by their significant effect on treatments in the flavor and taste score content between samples of different treatments.

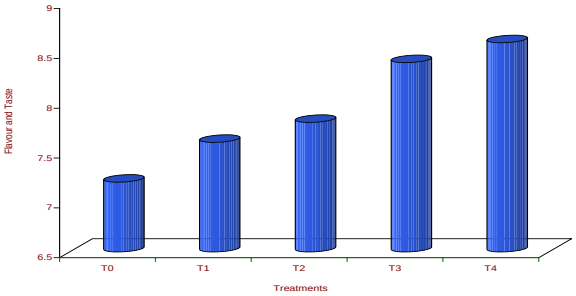



**Fig 1: Flavour and Taste percentage in sample of experimental date pulp frozen yoghurt of different treatments**

**Body and Texture:**

The meant body and texture percentage in samples of date pulp frozen yoghurt samples was noted that highest mean body and texture personage was recorded in the date pulp frozen yoghurt sample of $T_1$ (8.00) followed by $T_2$ (7.80) followed by $T_3$ (7.60) followed by $T_0$ (7.40)followed by $T_4$ (7.20). However the differences in these values were found non-significant indicating by their non-significant effect on treatments in the body and texture score content between samples of different treatments.

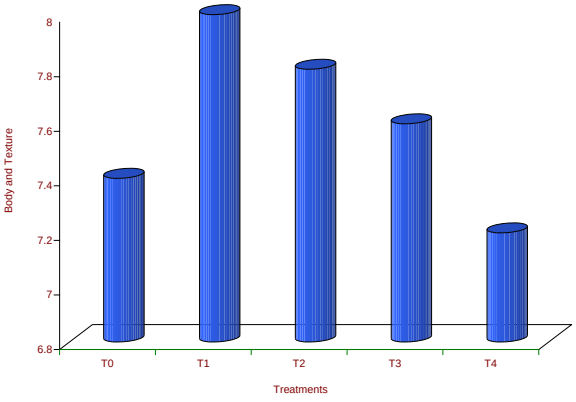



**Fig 2 : Body and Texture percentage in sample of experimental date pulp frozen yoghurt of different treatments**

**Colour and Appearance :**

The meant colour and appearance percentage in samples of date pulp frozen yoghurt samples was noted that highest mean colour and appearance personage was recorded in the date pulp frozen yoghurt sample of $T_4$ (8.60) followed by $T_3$ (8.40) followed by $T_1$ (8.20) followed by $T_0$ (8.00)followed by $T_2$ (7.80). However the differences in these values were found non-significant indicating by their non-significant effect on treatments in the colour and appearance score content between samples of different treatments.

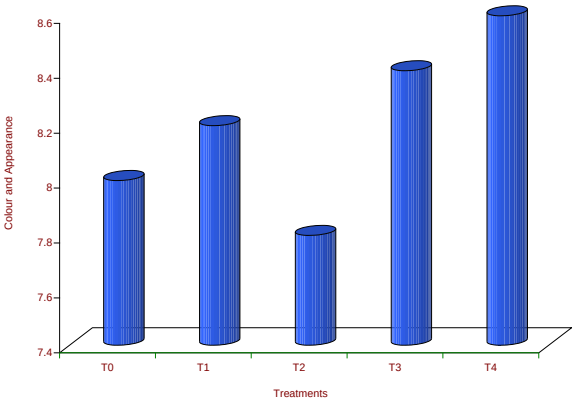



**Fig 3 : Colour and Appearance percentage in sample of experimental date pulp frozen yoghurt of different treatments**

**Overall acceptability:**

The meant overall acceptability percentage in samples of date pulp frozen yoghurt samples was noted that highest mean overall acceptability personage was recorded in the date pulp frozen yoghurt sample of $T_4$ (8.13) followed by $T_3$ (8.13) followed by $T_1$ (7.93) followed by $T_2$ (7.79)followed by $T_0$ (7.53). However the differences in these values were found significant indicating by their significant effect on treatments in the overall acceptability score content between samples of different treatments.

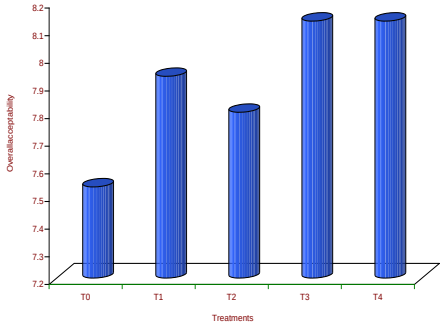



**Fig 4 : Overall Acceptability in sample of experimental date pulp frozen yoghurt of different treatments**

## Conclusion

In view of experimental results obtained during the present investigation it may be concluded that the samples of treatment T3and T4 was found the best in every aspect of organoleptic analysis ,i.e.,colour & appearance ,flavor & test and overall acceptability.

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