

Study of Chemical Frozen Yoghurt Supplemented by Using Different Concentration of Date Pulp

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Abstract:

The present investigation was carried out to develop improved 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. Total four combination of milk and date pulp (96:4, 94 :6,92:8,90:10) was satisfactory blended to yoghurt cultures i.e. Streptococcus salivarius ssp. thermophilus NCDC074, and Lactobacillus delbrueckii ssp. bulgaricus MCDC009 following by incubation at 40°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%. Date pulp decreased fat, acidity, protein, moisture and increased total solid, Ash, carbohydrate, based on the statistical analysis data obtained from various parameters using different ratio of milk and date pulp.

Key words: Frozen yoghurt, Date pulp, Chemical Characteristics, Yoghurt culture.

1- Introduction

Frozen yogurt is a complex fermented frozen dairy dessert that combines the physical characteristics of ice cream with the taste and

nutritional properties of fermented milk products **(Rahil 2012)**. The presence of frozen yogurt in the market is increasing those days not only because it is good for health due to its processing but also because it presents the opportunity of substituting the regular high fat content Ice cream **(Ordonez 2000)**. There are no international identity patterns for frozen yogurt although some countries have already defined some conditions for the product, that is, a minimum of treatable acidity **(Davidson et al., 2000)**. Most of the manufacturers of frozen yogurt say that it must always have a very important element the viable lactic acid bacteria **(Chandan 1997)**. Dates are some of the oldest sweeteners in the world .providing deep rich flavor to dishes both savory and sweet date syrup less sweet than agave nectar and honey ,but sweeter than granulated sugar . The date is rich in carbohydrates, dietary fiber, vitamins and minerals. There is considerable interest in extending the range of food by incorporating fruits in dairy foods for infant dairy food formulas, baby food, fruits juice based products, cereal based products and pharmaceuticals **(Singh 2010)**. Recent studies have shown that ingestion of foods containing *Lactobacillus* prevent or morbidity from enteric infections and lower respiratory tract infections **(Sur D, 2010)**, **(Sazawal 2011)**. There is considerable interest in extending the range of foods by incorporating foods in dairy foods for infant dairy food formulas, baby foods, fruits juice based products, cereal based products and pharmaceuticals. Like milk, yoghurt is a healthy and delicious food due to its high nutritive and therapeutic value **(Perdigonet al., 2002)**. Due to low lactose content yoghurt is easily digestible and palatable than milk. Yoghurt is valued for controlling the growth of bacteria and in curing of intestinal disease like constipation, diarrhea and dysentery, anti-carcinogenic effect and lowering of blood cholesterol **(Kamruzzaman 2002)**. Preparation of fruit yoghurt has been investigated by a number of researchers in different parts of world **(Dsai, 1994)** and **(Shukla, 1987)**. 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. 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 ZaidYousif, 2004**).

2- Material And Methods

Experimental frozen yoghurt mix prepare by using full cream milk with 5% fat and 11% milk solid not fat. With the addition of 12 % sweetening agent (sucrose) and 0.3% stabilizer have very important functions, such as increase in viscosity of ice cream mix and emulsifier is a chemical that encourages the suspension of one liquid in another so that they form one homogenous substance. The mix standardize to a total solid content of 28% by addition of skim milk. The mix homogenize and then pasteurize and cool to 42°C and yoghurt starter culture add at 2.5% then date pulp add at 4%, 6% , 8% & 10% for **T₁, T₂, T₃ & T₄** respectively Then mix incubate at 42°C till we achieve an acidity of 0.45%. The mix is aged at 5°C and frozen in a batch freezer to an overrun of 70%.

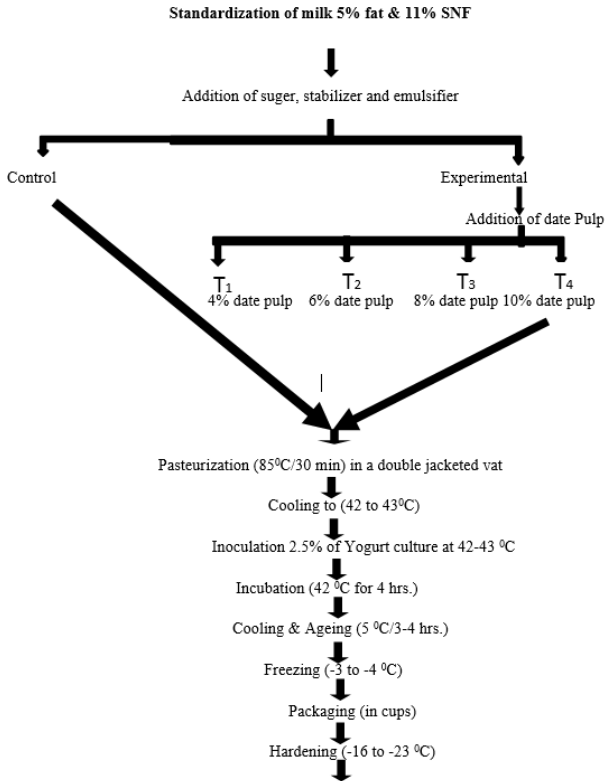
Material required

- **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-Haryana-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.
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Plate 1: Protein Test for distillation and titration Plate 2 : Fat test

Fig: Table No-4.1- Process Flowchart for Control and Experimental Frozen Yoghurt.



3- Result and Discussion

Results

Parameters	Treatments				
	T0	T1	T2	T3	T4
1. Chemical Analysis					
Fat	4.98	4.77	4.75	4.60	4.49
Total solids	28.30	30.25	31.22	32.18	33.16
Acidity	0.85	0.83	0.81	0.79	0.78
Protein	3.24	3.10	2.98	2.95	2.81
Moisture	71.74	69.75	68.79	67.82	66.84
Carbohydrate	19.55	21.75	22.81	23.94	25.15
Ash	0.53	0.62	0.67	0.69	0.71

Fat test:

The mean fat percentage in samples of date pulp frozen yoghurt samples was recorded in the date pulp frozen yoghurt sample of T₀ (4.98) followed by T₁ (4.77) followed by T₂ (4.75) followed by T₃ (4.60) followed by T₄ (4.49). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments (plate 2).

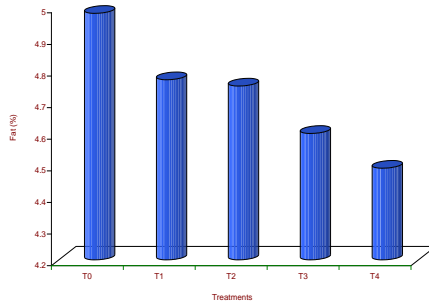


Fig 4.2 Fat percentage in sample of experimental date pulp frozen yoghurt of different treatments

Total solid:

The meant total solid percentage in samples of date pulp frozen yoghurt samples was noted that highest mean total solid percentage was recorded in the date pulp frozen yoghurt sample of T₄ (33.16) followed by T₃ (32.18) followed by T₂ (31.22) followed by T₁ (30.25) followed by T₀ (28.30). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments.

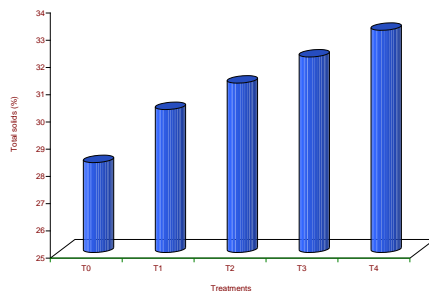


Fig 4.3 Total solid percentage in sample of experimental date pulp frozen yoghurt of different treatments

Moisture test :

The meant moisture percentage in samples of date pulp frozen yoghurt samples was noted that highest mean Moisture percentage was recorded in the date pulp frozen yoghurt sample of T₀ (71.74) followed by T₁ (69.75) followed by T₂ (68.79) followed by T₃ (67.82) followed by T₄ (66.84). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments.

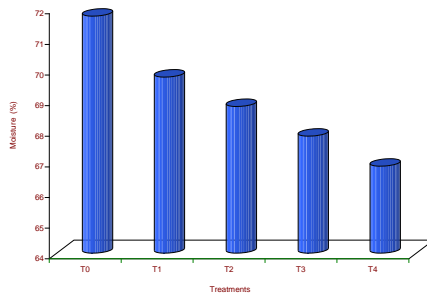


Fig 4.4 Moisture percentage in sample of experimental date pulp frozen yoghurt of different treatments

Protein test:

The meant protein percentage in samples of date pulp frozen yoghurt samples was noted that highest mean Protein percentage was recorded in the date pulp frozen yoghurt sample of T₀ (3.24) followed by T₁ (3.10) followed by T₂ (2.98) followed by T₃ (2.95) followed by T₄ (2.81). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments (plate 1).

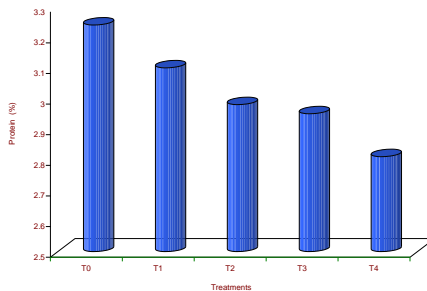


Fig 4.5 Protein percentage in sample of experimental date pulp frozen yoghurt of different treatments

Acidity test :

The meant Acidity percentage in samples of date pulp frozen yoghurt samples was noted that highest mean Acidity personage was recorded in the date pulp frozen yoghurt sample of T₀ (0.85) followed by T₁ (0.83) followed by T₂ (0.81) followed by T₃ (0.79) followed by T₄ (0.78). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments.

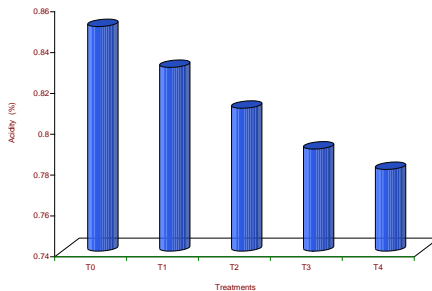


Fig 4.6 Acidity percentage in sample of experimental date pulp frozen yoghurt of different treatments

Ash test:

The meant Ash percentage in samples of date pulp frozen yoghurt samples was noted that highest mean Ash personage was recorded in the date pulp frozen yoghurt sample of T₀ (0.53) followed by T₁ (0.62) followed by T₂ (0.67) followed by T₃ (0.69) followed by T₄ (0.71). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments.

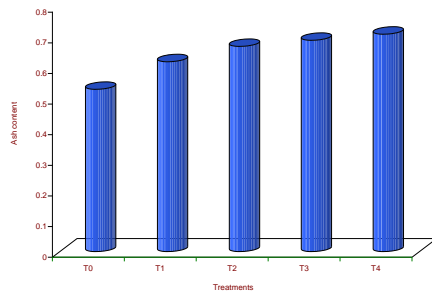


Fig 4.7 Ash percentage in sample of experimental date pulp frozen yoghurt of different treatments

Carbohydrate test:

The meant Ash percentage in samples of date pulp frozen yoghurt samples was noted that highest mean carbohydrate percentage was recorded in the date pulp frozen yoghurt sample of T₀ (19.54) followed by T₁ (21.70) followed by T₂ (22.79) followed by T₃ (23.91) followed by T₄ (25.12). However the differences in these values were found significant indicating by their significant effect on treatments in the fat score content between samples of different treatments.

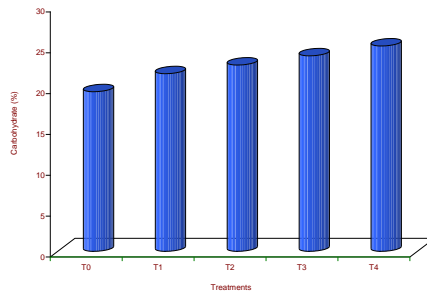


Fig 4.8 Carbohydrate percentage in sample of experimental date pulp frozen yoghurt of different treatments

4- Conclusion :

Fat test, Total solid test, Moisture test, Protein test, Acidity test, Ash test, Carbohydrate test were observed as given in result and discussion.

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