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## Studies on organoleptic evaluation and cost analysis of fruit yoghurt prepared from different levels of milk and strawberry pulp

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### Abstract

Yoghurt is a snow white, custard like fermented milk product, obtained through the controlled lactic acid fermentation of milk by *Lactobacillus bulgaricus* and *Streptococcus thermophiles*. A study was undertaken by using different levels of Milk and Strawberry pulp i.e. T<sub>1</sub> (95:05), T<sub>2</sub> (90:10), T<sub>3</sub> (85:15), T<sub>4</sub> (80:20) respectively. Experimental fruit yoghurt mix was standardized to 4.0% fat, 11.5% solids not fat, 10% sugar and 2% culture adjusted to 25.2% total solids. Yoghurt samples for different treatments were analyzed for organoleptic attributes (colour and appearance, body and texture, taste and flavour) by trained panelist using 9 point hedonic scale. The fruit yoghurt obtained from (85:15) (T<sub>3</sub>) ratio was the best product among all treatments. Thus, as far as product acceptability judged by organoleptic evaluation, the treatment can be rated as T<sub>3</sub> > T<sub>0</sub> > T<sub>2</sub> > T<sub>4</sub> > T<sub>1</sub>. The data regarding cost of Control and Strawberry pulp fruit yoghurt was found as cheap in T<sub>0</sub> (28.80 Rs/Kg) followed by, T<sub>1</sub> (33.36 Rs/Kg), T<sub>2</sub> (37.92 Rs/Kg), T<sub>3</sub> (42.48 Rs/Kg) and T<sub>4</sub> (47.04 Rs/Kg).

**Keywords:** Milk, Strawberry pulp, Fruit yoghurt.

### Introduction

Fermented milk products have been the essential part of our food consumption; since ancient times. The symbiosis of two most important microorganisms, i.e., *Lactobacillus bulgaricus* and *Streptococcus thermophiles* resulted in lactic acid fermentation to convert milk into a fermented milk product known as Yoghurt. It is an exotic product but now very much accommodated as an Indian fermented milk product, because of its nutritional and therapeutic value like *Dahi* "curd". Yoghurt is a low caloric diet. It can serve as an alternative source of calcium for people, who are lactose intolerant. It can help in stimulation of immune system, reduction in bacterial enzymes and reduction of serum cholesterol. It also helps in anti-tumor activity, Folic acid and vitamin B synthesis and enhances mineral bioactivity (David, 2012) [4]. Yoghurt is a famous fermented dairy product which plays an important role in preventing gastrointestinal infections which causes diarrhea. It also reduces the chances of cancer and lowers the blood cholesterol (Gilliland, 1979) [5]. Mudgal and Devendra (1999) [7] remarked that after cow, buffalo, is the most important dairy species. In India, buffalo's milk in general is considered to be inferior to cow's or buffalo's milk and is entirely used for beverage purpose. Yoghurt prepared from milk has been widely accepted for infants and convalescents because of its easy digestibility. Milk is more digestible than cow and buffalo's milk because of the smaller average size of the fat globules (Jennes and Patton 2005) [6]. Milk yoghurt did not show any whey off but is preferred for its smooth body and texture and sharp flavour. By the addition of fruit pulps in yoghurt its nutritional content viz. proteins and vitamins enhanced without compromising its palatability. This filler will also give nutritious product at an economic rate, which will make the product further popular in domestic and international market.

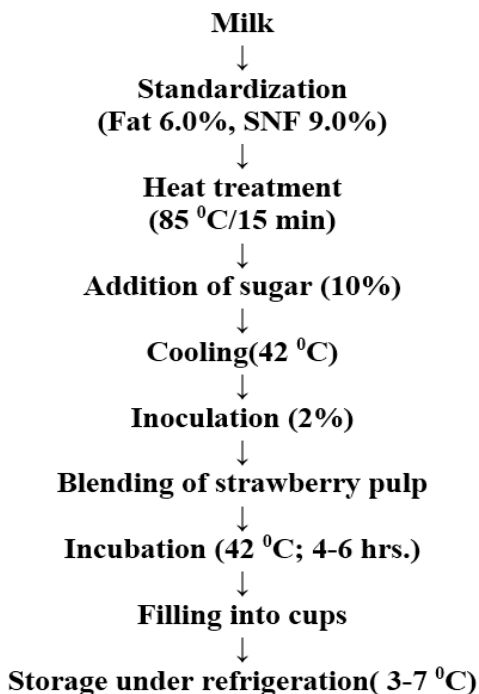
### Material and Methods

First of all fresh milk was collected and standardized for 6% fat and 9.0% SNF using spray dried skim milk powder. Then the milk was heated at 85°C for 5 minutes. Sugar was added @ 10% of milk. It was then cooled at 42°C. Milk was then inoculated with 2% culture. At this stage strawberry pulp was added @ 5, 10, 15 and 20%. The mix was then sent for incubation at 42°C. After that yoghurt was filled in the cups and sent for storage under refrigeration. Thus the yoghurt was ready. The samples were analyzed for physicochemical, microbial and organoleptic qualities as per procedure laid down by ICAR manual in Dairy chemistry and microbiology (1972) [2].

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**Table 1:** Details of different treatments for making Strawberry pulp fruit Yoghurt.

Materials (%)	Different treatments Strawberry pulp fruit Yoghurt				
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Milk	100	95	90	85	80
Strawberry pulp	-	05	10	15	20



**Fig 1:** Flow chart for preparation of Strawberry pulp fruit Yoghurt

**Organoleptic Evaluation of the prepared product**

Freshly prepared were control and Strawberry pulp fruit Yoghurt served for evaluation to panel members consisting of 5 experienced persons. 9 point hedonic scale proforma was used as suggested by Amerine *et.al.* (1965) [1].

**Results and Discussion**

**Organoleptic attributes of control and Strawberry pulp fruit Yoghurt.**

Table-2 shows organoleptic attributes of control and Strawberry pulp fruit Yoghurt.

**Table 2:** Average of different Organoleptic Parameters of the Control and Strawberry pulp fruit Yoghurt.

Parameters	Control and strawberry pulp fruit Yoghurt					F value	C.D.
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>		
Colour and Appearance	7.76	7.40	7.68	8.20	7.40	6.804*	0.156
Body and Texture	8.00	7.80	7.60	7.40	7.20	1.429**	-
Flavour and Taste	7.92	7.48	7.76	7.82	7.76	8.048*	0.171

\* Significant at 5 % level  
\*\* Non-significant at 5 % level

**Colour and Appearance**

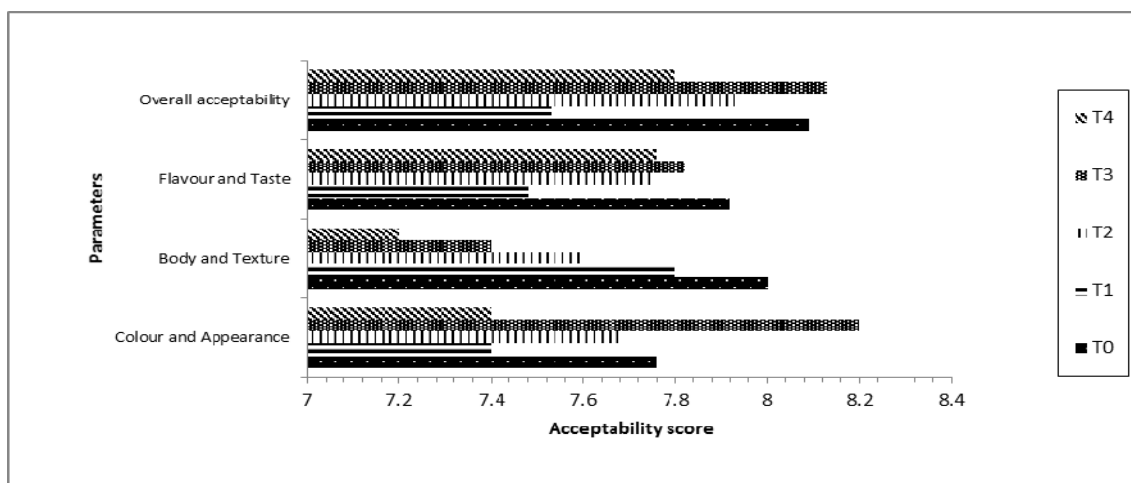
Table 3 showed that the highest mean value for colour and appearance in fruit yoghurt was found in T<sub>3</sub> (8.20), followed by T<sub>0</sub> (7.76), T<sub>2</sub> (7.68) T<sub>4</sub> (7.40) and T<sub>1</sub> (7.40). There were significant differences found among the treatments. F Value was 6.804, indicating significant effect of treatment on colour and appearance (Fig.2).

**Body and texture**

The highest mean value for body and texture were found in T<sub>0</sub> (8.00) followed by T<sub>1</sub> (7.80), T<sub>2</sub> (7.60), T<sub>3</sub> (7.40) and T<sub>4</sub> (7.20). There were no significant differences found among the treatments. F Value was 1.429, indicating no significant effect of treatment on body and texture (Fig.2).

**Flavour and Taste**

There was significant difference found among the treatments for flavour and taste score. The highest mean value for flavour and taste was found in T<sub>0</sub> (7.92), followed by T<sub>3</sub> (7.82), T<sub>4</sub> (7.76), T<sub>2</sub> (7.76) and T<sub>1</sub> (7.48). F Value was 8.048, indicating significant effect of treatment on flavour and taste (Fig.2).



**Fig 2:** Average of organoleptic parameters and overall acceptability score control and Strawberry pulp fruit Yoghurt.

**Overall acceptability of the Control and strawberry pulp fruit Yoghurt**

Table 3 and fig.2 showed the highest mean value for overall acceptability of the control and strawberry pulp fruit yoghurt

was found in T<sub>0</sub> (8.09), followed by T<sub>3</sub> (8.13), T<sub>2</sub> (7.93), T<sub>4</sub> (7.80) and T<sub>1</sub> (7.53). The data differed significantly among the treatments, thus showed the acceptability of the fruit yoghurt from milk and strawberry pulp.

**Table 3:** Overall acceptability of the Control and Strawberry pulp fruit Yoghurt.

Replication	Control and strawberry pulp fruit Yoghurt					F value	C.D.
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>		
R <sub>1</sub>	8.13	7.33	8.00	8.66	7.66	3.703*	0.038
R <sub>2</sub>	8.66	8.00	8.33	8.33	8.00		
R <sub>3</sub>	8.66	7.66	8.00	8.33	8.00		
R <sub>4</sub>	8.00	7.33	7.66	8.00	8.00		
R <sub>5</sub>	7.00	7.33	7.66	7.33	7.33		
Mean	8.09	7.53	7.93	8.13	7.80		

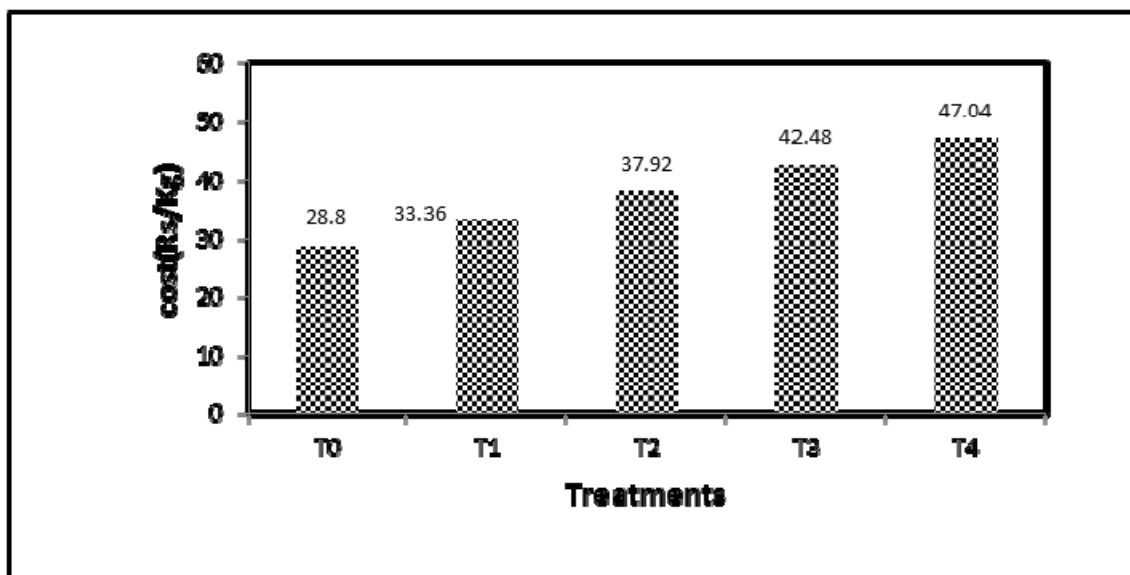
\* Significant at 5 % level  
 \*\* Non-significant at 5 % level

**Cost Analysis of control and Strawberry pulp fruit yoghurt**

The data regarding cost of Control and Strawberry pulp fruit yoghurt was found as cheap in T<sub>0</sub> (28.80 Rs/Kg) followed by, T<sub>1</sub> (33.36 Rs/Kg), T<sub>2</sub> (37.92 Rs/Kg), T<sub>3</sub> (42.48 Rs/Kg) and T<sub>4</sub> (47.04 Rs/Kg) (Table.4 and Fig.3).

**Table 4:** Cost Analysis of control and Strawberry pulp fruit yoghurt

Parameters	Control and Strawberry pulp fruit yoghurt				
	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>
Cost(Rs/Kg)	28.80,	33.36,	37.92	42.48	47.04



**Fig 3:** Cost Analysis of control and Strawberry pulp fruit yoghurt

**Conclusion**

The results obtained from the statistical analysis revealed that the milk and strawberry pulp can be satisfactorily used to manufacture fruit yoghurt. Fruit yoghurt contain 15% strawberry pulp (T<sub>3</sub>) found to be best among all the treatments. The data regarding cost of Control and Strawberry pulp fruit yoghurt was found as cheap in T<sub>0</sub> (28.80 Rs/Kg) followed by, T<sub>1</sub> (33.36 Rs/Kg), T<sub>2</sub> (37.92 Rs/Kg), T<sub>3</sub> (42.48 Rs/Kg) and T<sub>4</sub> (47.04 Rs/Kg).

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