Assess The Physicochemical Properties And Nutritional Composition of The Prepared Orange Fruit Frozen Yoghurt

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Abstract- *The present study entitled " Assess the physicochemical properties and nutritional composition of the prepared orange fruit frozen yoghurt" was carried in order to find out the feasibility of preparation and nutritional aspects of products prepared by incorporation of orange pulp to determine the chemical properties of the prepared product orange frozen yoghurt were used to prepare with three treatments and one control products i.e. T1, T2, T3 and T0 were prepared by incorporation of Skimmed milk 80%, SMP 3%, sugar 14.6%, culture 2%, emulsifier 0.2%, stabilizer 0.2% and Control T0 . Nutritive value of the prepared products was calculated using food composition table given by Gopalan et. al.(2015) . The experiment was replicated three variance (ANOVA) and Critical Difference (CD) techniques. From the results, it is calculated orange frozen yoghurt and pomegranate frozen yoghurt increase the nutritive value frozen yoghurt treatment T3 (Skimmed Milk 65%, orange pulp15%, SMP 3%, sugar 14.6%, emulsifier 0.2%, stabilizer 0.2%) acceptability. The nutritional composition of all treatment in the frozen yoghurt increased energy, carbohydrate, protein, iron, calcium, polyphenols, and flavonoid using standard chemical procedures. The pH and viscosity TSS was analyzed using standard AOAC (2005)*

Keywords- Health benefits, antioxidant, Nutrient, starter culture, chemical test.

I. INTRODUCTION

Yoghurt is regarded to be nutritious than the milk from which is made. Consumption of Yoghurt provides energy through fat and carbohydrates, muscle building protein, bone forming minerals and essential growth factors is terms of vitamins through the action of microorganism Fruits are an important part of a healthy diet. They are naturally low in calories, fat, sodium, and cholesterol. Fruits play and important role in keeping the body healthy and have many benefits including. Fruits lower risk of illness disease. Fruits contain many vitamins and nutrients that may reduce risk for many illnesses including: Stroke, heart disease and other heart – related illness, Type 2 diabetes, certain cancer, such as mouth, stomach, and colon – rectum cancer, Kidney stones, Bone loss.

Fruits hydrate the body. Fruits are made up of 90 to 95 percent water is an important nutrient. It is responsible for transporting nutrients around the Body, regulating body temperature, keeping joint moist, and getting rid of waste products in the body. Fruits are rich in fiber, which is essential for the smooth movement of food in the body's digestive system. Fruits help maintain every day eat will prevent constipation. Fruits give the body energy and contain carbohydrate, which are the body's main source of energy. Citrus family had rich source of phytochemical such as flavanones, polyphenols, and anthocyanin and hydroxycinnamic acids which are beneficial to most pathological conditions which includes, high cholesterol and anti inflammation; complications related to diabetes and cancer prevention

Orange fruits benefits of health in hypertension, cancer, heart disease, and diabetes are closely related to dietary habits. The major phenolic compound present in the orange include hydroxycinnamic acids (HCA) and flavonoid, among which, flavanones are the most prevalent citrus flavonoid, especially hesperidins, have a wide of therapeutic properties, including anti – inflammatory, antihypertensive, diuretic, analgesic, and hypolipidemic activities. The concentration of antioxidant components very among the antioxidant activity of orange parts may also vary. In general, the peel of the fruit contains a higher concentration of antioxidant substance than the flesh of the fruit. **Park *et al.,*(2014)**

Orange frozen yoghurt prevents of Hypertension, cancer, heart disease, and diabetes are closely related to dietary habits. Recently, functional foods have gained popularity because they can reduce the incidence of these diet-related diseases. Epidemiological studies strongly suggest that foods containing photochemical, such as fruits and vegetables

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containing antioxidants, have protective effects against disease. Consumption of fruits and vegetables prevents degenerative processes caused by oxidative stress.

II. MATERIALS AND METHODS

This present investigation "Assess the physicochemical properties nutritional composition of the prepared orange fruit frozen yoghurt" was conducted in the Nutrition Research Laboratory of the Department of Foods & Nutrition, Ethelind School of Home Science, Sam Higginbottom Institute of Agriculture Technology & Sciences, Allahabad, U.P.

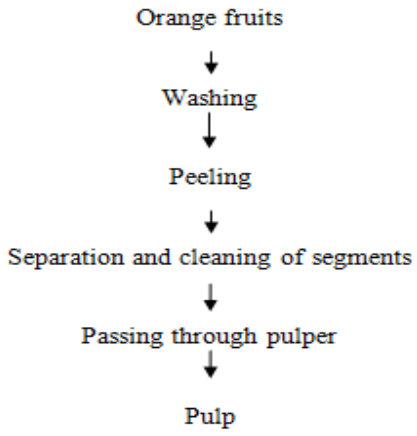
1. PROCUREMENT OF RAW MATERIALS:-

a. Milk was purchased from Student Training Dairy, Department of Dairy Technology, SHIATS, Allahabad.
b. Fresh ripe oranges were purchased from local fruits market of Allahabad.
c. Yogurt culture was purchased from National Collection of Dairy Culture, Dairy Microbiology Division of NDRI Kernal Haryana, India.
d. Sugar was purchased from local market of Allahabad.

2. SITE OF EXPERIMENT:-

The present investigation was carried out in the Nutrition Research Laboratory of Foods & Nutrition Department, Ethelind School of Home Science and Research Laboratory of Warner School of Food and Dairy Technology Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad.

Preparation of Orange Pulp:



(Source: Srivastava and Kumar 2009).
Fig1: Flowchart for preparation of Orange pulp.

III. TREATMENT COMBINATION

Treatments and replications of value added food products enriched with fruit orange frozen yoghurt were as follows:-

- **Treatment of products:-**

The basic frozen yoghurt added skimmed milk (80%), SMP (3%) sugar (14.6%), culture (2%), emulsifier (0.2%), stabilizer (0.2%) which served as control (T_0) for each product. The value addition treatments were done with orange pulp extract at (5%, 10%, 15%) level and referred to as T_1, T_2, and T_3 respectively. The amount of frozen yoghurt was varied at each treatment at 5%, 10%, and 15% Orange frozen yoghurt. Control and treatments for each preparation were replicated 3 times respectively.

Table of treatments of products:-

Table: Orange fruit frozen Yoghurt:-

Control and Treatments / Products	T_0	T_1	T_2	T_3
Skimmed milk	80%	75%	70%	65%
Sugar	14.6%	14.6%	14.6%	14.6%
Culture	2%	2%	2%	2%
Fruits	-	5%	10%	15%
Stabilizer	0.2%	0.2%	0.2%	0.2%
Emulsifier	0.2%	0.2%	0.2%	0.2%
SMP	3%	3%	3%	3%

Sensory evaluation of Frozen Yoghurt:

The sensory evaluation of frozen yoghurt sample was done by a panel member of five judges among the faculty member of Ethelind School of Home Science for the using Nine point Hedonic scale. Evaluation was done for Taste and Flavor, Body and texture, Colour and Appearance and Overall Acceptability.

Analysis of sample

Determination of Acidity: - Titrable acidity of frozen Yoghurt (expressed as lactic acid) determined as per the procedure laid down in IS: 1479, PART: I.

Principle: - present acid in milk is determined by titrating against standard base and stated in term of predominant acid.
Requirement: - Conical flask, measuring cylinder, burette, phenolphthalein indicator and N/10 standard NAOH Solution.

Procedure: - Take 20 ml of milk Add 2-3 drops of phenolphthalein as indicator. Titrate against 0.1 NAOH solution till milk turn rose red. Process is repeated at least 3 times.

Calculation:-

$$\text{Percent lactic acid} = \frac{\text{eq.wt.} \times \text{Normality}}{20}$$

$$\text{Percentage acidity} = \frac{A \times V}{10 \times W}$$

Where, V= Vol. of NAOH used.
W= Vol. of milk taken.
A= Equivalent weight of acid.

Total solid: - the percent total solid in frozen yoghurt were determination as per I.S.2802 (1964).

Procedure:-

1. Take a clean shallow bottom dish of aluminum, Stainless, Steel, Nickel, Silica or porcelain about 8cm in diameter and 2.5cm in height Heat in oven at 102º C for about 2 Hours. Cool in a desiccate and weight. This gives its take weight.
2. Pipette out 5 ml of sample into the dish and weight (w_1 gm. Place the dish on a boiling water bath for at least 30 minutes.
3. Transfer into a hot air oven.
4. Heat at 100º C the process of heating cooling and weighing until and difference between two successive weighing is not more than 0.0005 gm. Note the lowest weight (w_2 gm).
5. Calculate the percentage of total solid multiplying the weight of the reside by 100, dividing by the weight of sample taken.

Calculation:-

$$\text{\% total Solid} = \frac{\text{weight of residue} \times 100}{\text{weight of milk}} = \frac{W2 - W \times 100}{W1 - W}$$

Take weight of dish –Wgm
Weight of dish + sample = W_1 gm
Weight of dish = residue = W_2 gm

IV. DETERMINATION OF pH

The pH of the food product is measured by using pH meter. pH is standardized using standard buffer of pH 4. The product whose pH is to be determined is taken in a beaker. The electrodes of the pH meter are dipped into it for one minute and the pH is recorded. The electrodes of the pH meter are washed with distilled water after each determination.

V. DETERMINATION OF VISCOSITY

Principle

The viscosity of a frozen Yoghurt sample solution is determined at 60ºC by measuring the flow time of 100 ml of the solution through a standard pipette.

Apparatus

1. Pipette: Calibrated 100 ml pipette with a precision capillary outlet and upper and lower mark on the glass.
2. Thermostatic bath: equipped with thermostatic device, such as a heating circulator, to maintain 60.00 ± 0.05ºC.
3. Precision thermometer: graduated in 0.01ºC with a long slim stem for measuring temperature inside the pipette.
4. Stop watch: accurated to 0.01 seconds.
5. Balance: with 0.01 g sensitivity
6. Water bath: constant temperature at 65 ± 0.5º

Procedure

1. 7.50 ± 0.01 ml of Yoghurt sample was weighed into a 150 ml beaker.
2. 105.0 ± 0.2 ml of de-ionized water was added and stirred often to suspend all gelatin particles.
3. Covered and let stand 1 – 3 hours at room temperature
4. The sample was dissolved in a 65ºC water bath for 10 – 15 minutes, stirring or swirling as required.
5. When the temperature of the solution reached 61ºC, and the sample was completely dissolved and thoroughly mixed, the solution was transferred to the viscosity pipette and was proceeded with the viscosity determination.
6. A finger of the free hand was used to cover the capillary end of the pipette and poured enough

solution into the pipette to bring the level approximately 1 cm above the upper mark.

7. The thermometer was placed inside the pipette and rises slowly and lowered it until a constant temperature of 60.00 ± 0.05ºC was maintained.
8. Thermometer was removed from the pipette.
9. Reading was done and time was recorded for 100 ml of solution to pass through the capillary tube of the pipette by draining the gelatin solution and starting the stopwatch as soon as the meniscus of the liquid hits the top line of the pipette. The stopwatch was stopped when the meniscus hits the lower line of the pipette.
10. The time obtained to the nearest tenth of a second was recorded; this value waste efflux time.

Calculation of the Viscosity

The viscosity (to the nearest millipoises) at 60ºC of sample with efflux time

t (in seconds) was calculated from the following equation:

V = (A*t* – B/*t*) x d
V = Viscosity, in millipoises (mp)
A, B = A and B pipette constants
t = efflux time, in seconds
d = solution density

Pipette Calibration

1. Pipettes were calibrated using two standard oils of different viscosities.
1. The pipettes were thoroughly cleaned before the calibration and dried with reagent grade acetone.
2. Both oils were pre-heated in a constant temperature bath set at 63-64ºC.
3. The efflux time (*t*) was obtained, in triplicate, for each standard at 60ºC.
   The pipette was cleaned thoroughly between different oils using a suitable organic solvent for removing the oil and acetone to remove residual solvent and dry.
4. Calculation of the A and B constants:

B = *t1t2* (V2*t1* – V1*t2*)
t22 – t12
A = V1 + B/*t1* = V2 + B/*t2*
t1 t2
V1 = kinematic viscosity of lower viscosity oil, in millistokes
V2 = kinematic viscosity of higher viscosity oil, in millistokes
t1 = average efflux time of lower viscosity oil, in seconds
t2 = average efflux time of higher viscosity oil, in seconds

Determination of Total Soluble Solids (TSS)

Principle: Determining the total soluble solids (Brix) is an important measurement taken in a wide range of crops. In the citrus industry this is a measure of the total soluble solids in the juice. These soluble solids are primarily sugars; sucrose, fructose, and glucose. As the flesh of fruit forms it deposits nutrients as starch that, as the fruit ripens, transform to sugars. The percentage sugar, measured in degrees Brix (^{o}Brix), indicates the sweetness of the fruit by measuring the number of soluble solids in the Yoghurt. Citric acid and minerals in the Yoghurt also contribute to the soluble solids.

Equipments

1. Refractometer
2. Frozen Yoghurt
3. Damp tissue

Procedure

1. Refractometer was taken.
2. The refractometer prism surface was cleaned and dried.
3. A small amount of yoghurt sample was placed onto the prism of the refractometer.
4. While pointing the prism in the direction of good light (not directly at the sun), it was looked through the eyepiece.
5. Reading was taken from where the base of the blue colour sits on the scale and records the % percentage sugar (°Brix).
6. The refractometer was cleaned immediately with a damp tissue, and dried thoroughly.

Note: °Brix shown in the refractometer is equal to the percentage of total soluble solids in the fruit sample. Measurement is done at a constant temperature of 20^{0}C.

Result:

VI. CHEMICAL ANALYSIS

1. Determination Of Total Carbohydrate:-

Principle: - Carbohydrates are first hydrolyzed into simple sugars using dilute hydrochloric acid. In hot acidic medium glucose is dehydrated to hydroxymethyl furfural. This compound forms with anthrone a green colored product with an absorption maximum at 630 nm.

Materials:-

- 2.5 N HCl
- Anthrone reagent: 200 mg anthrone dissolved in 100 ml of ice-cold 95% H_2 SO_4. It should be prepared fresh before use.
- Standard glucose: Stock—Dissolve 100 mg in 100 ml water. Working standard—10 ml of stock diluted to 100 ml with distilled water. Store refrigerated after adding a few drops of toluene.

Procedure:-

1. 100 mg of the sample was weighed into a boiling tube.
2. It was hydrolyzed by keeping it in a boiling water bath for three hours with 5 ml of 2.5 N HCl and cool to room temperature.
3. It was further neutralized with solid sodium carbonate until the effervescence ceases.
4. The volume was made to 100 ml and centrifuged.
5. The supernatant was collected and 0.5 was taken and 1ml aliquots for analysis.
6. The standards were prepared by taking 0, 0.2, 0.4, 0.6, 0.8 and 1 ml of the working standard. '0' serves as blank.
7. The volume was made to 1 ml in all the tubes including the sample tubes by adding distilled water.
8. 4 ml of anthrone reagent was added.
9. It was further heated for eight minutes in a boiling water bath.
10. It was cooled rapidly and reading was taken from green to dark green color at 630 nm.
11. Standard graph was drawn by plotting concentration of the standard on the X-axis versus absorbance on the Y-axis.
12. From the graph, the amount of carbohydrate present in the sample tube was calculated.

Calculation:-

$$\text{Amount of carbohydrate present in 100 ml of the sample} = \frac{\text{mg of glucose}}{\text{Volume of test sample}} \times 100$$

2. Determination Of Vitamin C

Principle: This method was based upon the reduction of the dye 2-6-dichlorophenol indophenols by an acid solution of ascorbic acid. In the absence of interfering substances (Cu^{++}, Fe^{++}, Sn^{++} etc.) the reducing capacity of the extract of the sample is directly proportional to the ascorbic acid content.

Reagents:

1. Standard ascorbic acid: 2oo ml of pure ascorbic acid was accurately weighed on a tarred black glazed paper and transferred to a clean 100 ml volumetric flask. It was dissolved in 1% oxalic acid solution and the volume was made up to the mark with same acid. Mixed well. The solution was immediately used as it was unstable. Water was not used as vitamin activity is lost when the lactone ring of dehydroascorbic acid is hydrolyzed by water to di-keto gluconic acid.
2. 2-6-dichlorophenol-indophenol dye indicator: 50 mg of the sodium salt of 2-6-dichlorophenol-indophenol was dissolved or its equivalent in about 150 ml of hot water containing 42 mg of sodium bicarbonate. It was cooled under tap water and diluted to 200 ml with distilled water place in a brown colored glass stoppered bottle and was kept in a refrigerator or away from sunlight at 3C. The solution should not be keep for more than 1 week.
3. Oxalic acid solution: 1%.

Standardization:

The dye solution needs to be standardized every time it is used. 5 ml of the ascorbic acid standard solution was pipette out. In a small clean conical flask, 5 ml of 1% oxalic acid solution was added and titrated with the dye indicator rapidly to a faint pink color end point that persist for 15 sec from the column of the dye used in the titration. The ascorbic acid equivalent of the dye was calculated in mg/ml.

Procedure:

1. Yoghurt sample was taken and filtered through cheese cloth.
2. 10ml of the juice was measured and pipette into a 100 ml volumetric flask and diluted to the mark with 1% oxalic acid solution.
3. It was mixed thoroughly. The dilute sample solution was filtered through dry filter paper.
4. The first few ml of the filtrate was discarded.
5. 10 ml or 20 ml aliquot of the filtrate was pipette into a small Erlenmeyer flask and titrated immediately with the standardized dye indicator solution to a faint pink color end point that persist for 15 seconds.

Standardization of dye:

Sl no	Vol of Stan. Vit C	Conc. Of Stan. Vit C	Initial vol of the dye(ml)	Final vol of dye(ml)	Difference(ml)
1.					
2.					
3.					

E= mg of ascorbic acid/ml of dye.

Determination of Vit C

Sl no	Vol of sample	Initial vol of dye(ml)	Final vol of dye(ml)	Difference (ml)
1.				
2.				
3.				

Calculation: Calculate the ascorbic acid content in mg/100 ml of the sample as follows:

$$\text{Ascorbic acid mg/100ml} = \frac{EV \times V \times 100}{V2 \times W}$$

Where, E=ascorbic acid equivalent of the dye in mg/ml
V=ml of the dye indicator used in the titration
V1=volume to which the Yoghurt is diluted
V2=Volume of the filtrate taken for the titration
W= Volume of the fruit juice initially taken for the determination

Result: Ascorbic acid content of the sample was mg/ml.

3. Determination Of Antioxidant

The Yoghurt sample were filtered through 4-fold muslin cloth and the Yoghurt was collected in clean containers.

A. DETERMINATION OF TOTAL POLYPHENOL CONTENT

Principle:

Polyphenol was extracted with 70% methanol from a test portion of finely ground sample at 70^0 C. The Polyphenol in the extract are determined calorimetrically using Folin-Ciocalteu phenol reagent. The reagent contains phosphor-tungstic acids as oxidants, which on reduction by readily oxidized phenolic hydroxyl groups yield a blue color with a broad maximum absorption at 765nm. This is due to the formation of tungsten and molybdenum blues.

Procedures:

Standard solution- 0.110 g of gallic acid monohydrate (M= 188.14) was weighed into 100 ml volumetric flask. It was dissolve in water and diluted to the mark and mixed (stock standard). The volume of gallic acid stock standard solution given in (Table 1) was transferred using pipettes to 100 ml one mark volumetric flasks. It was dilute to the mark with water and mixed. This dilute solution was prepared on the same day of used.

Table-1

Gallic acid standard solution	Volume of Gallic acid stock solution (ml)	Nominal concentration of dilute standard (µg/ml)
A	1.0	10
B	2.0	20
C	3.0	30
D	4.0	40
E	5.0	50

Sample preparation-

- 5 ml of methanol was taken in test tubes (duplicates) and heated in water bath set at 70 ℃, and allowed at least 30 min for heating.
- 0.2 ml of samples (duplicates) was taken and dissolved in above test tubes. Heating was continued in water bath for 10 min.
- Tubes were removed from the water bath and allowed it to cool to room temperature.
- The supernatant of the two test tubes was carefully merged in another test tube.
- Using a pipette, 1 ml of the diluted sample extract was transferred into another test tube. Using a pipette, add 5 ml of dilute Folin-Ciocalteu phenol reagent into each test tube and mixed.
- Within 3 to 8 min after the addition of the diluted Folin-Ciocalteu phenol reagent, 4ml sodium carbonate solution was pipette into each test tube and was mixed carefully (blue color appears).
- Allowed to stand at room temperature for 60 min and the optical density was measured by spectrophotometer set at 765nm.

Calculation:

Total content of Polyphenolic compounds was calculated by the following formula:

$$X = \frac{5.6450 \times A}{m}$$

Where; X – Total Polyphenolic compounds [%], A – absorbance, m – mass of investigated Sample [ml].

B. DETERMINATION OF TOTAL FLAVANOID CONTENT

Reagents: Aluminums trichloride, quercetin, ethanol

Procedure:

1 ml of 2% Aluminium trichloride was mixed with the same volume of sample juice. Absorbance readings at 430nm were taken after 10 minutes against a blank sample consisting of 1 ml of sample solution and 1 ml of distilled water without aluminium trichloride. The total Flavanoid content was determined using a standard curve of quercetin at 0-50 mg/ml. The average of three readings was used and then expressed as milligrams of quercetin equivalents/100 ml of juice sample.

Calculation:

Flavanoid content = quercetin equivalent (µg/ml) × total volume of ethanol extract (ml) + sample weight (ml) × dilution factor × 10^{-6} (g/µg) × 100

VII. RESULTS AND DISCUSSION

The data of the present studies "Assess the physicochemical properties and nutritional composition of the prepared orange fruit frozen yoghurt" on different aspects as per the methodology was tabulated and analyzed statistically

Table : Average sensory score for different parameters in control and treated samples of "Orange fruit frozen yoghurt":-

Treatment	Color	Consistency	Taste & flavor	Overall acceptability
T_0	5.2	6.8	4.8	5.4
T_1	6.6	6.8	6.8	6.6
T_2	8	8.2	7.2	7.6
T_3	**8.4**	**8.6**	**8.6**	**8.4**
F%	S	S	S	S
C.D	0.2	0.4	0.2	0.1

Clearly from the above table number 8.3, we can see that the treated sample T_3 of the prepared beverage has the highest score in terms of its sensory evaluation. It had increased acceptability as according to the panel of judges. This was followed by T_2, and T_1. These were moderately appreciated by the panel of judges.

From the ANOVA table, it has been found that the calculated value of F (9.1) in case of the color was higher than the table value of F (3.26) at 5% degree of freedom level of probability. Hence it can be said that there was significant difference regarding the color of the beverage due to addition of different amounts of orange pulp.

In case of the consistency of the product we can see that the judges found the T_0 and T_1 almost equally acceptable as was with T_2 and T_3. From the ANOVA table, we note that the calculated value of F (9.1) is lower than the table value of F (4.76) at 5% degree of freedom level of probability. Hence there is no significant difference between the treatment samples as far as consistency is concerned.

In case of taste and flavor of the prepared beverage, T_3 has the highest score. It appealed the most to the panel of judges. This was followed by T_2 and T_1 respectively. From the ANOVA table it is clear that the calculated value of F (68.3) is higher than the table value of F (4.76) at 5% degree of freedom level of probability. Hence the taste and flavor of the product significantly differed in each treatment due to the addition of the different amounts of Orange pulp.

The treated sample of T_3 was most acceptable by the panel of judges on an overall basis. This was followed by T_2, and T_1 respectively. The calculated value of F (21) is higher than the table value of F (4.76) at 5% degree of freedom level of probability. Hence there was found to be significant difference in the overall acceptability between the treated samples of the products.

Table: Average percentage of nutrients in control and treated samples of "Orange fruit frozen yoghurt".

Control and Treatments / Nutrients	T_0	T_1	T_2	T_3
Energy (kcal)	56	60.85	65.7	**70.55**
Carbohydrate (g)	7.4	9.27	11.4	**13.01**
Fat	1.55	1.57	1.59	**1.61**
Protein (g)	4.8	4.84	4.88	**4.92**
Vitamin–C (mg)	2.2	19	38	**57**
Calcium (mg)	162	163.82	165.7	**167.55**
Iron (mg)	-	0.010	0.015	**0.0225**
Total Polyphenol content (mg)	4.5	95.14	165.2	**235.43**
Total flavonoid content (mg)	3.95	21.95	28.9	**35.85**

The above table shows the nutritional composition of the frozen yoghurt skimmed milk (80%),SMP(3%), and sugar (14.6%), emulsifier (0.2%), culture (2%), stabilizer (0.2%) as the control T_0. has been added to all the treated sample Orange pulp as T_1 (5%), T_2 (10%), T_3 (15%) .

shows that average nutritional composition of orange frozen yoghurt with incorporation of orange pulp shows that the nutrient content i.e. Energy, carbohydrate, protein, calcium, iron, Polyphenol, flavonoid increased with the addition of orange pulp.

The nutrient calculation of prepared fruit orange frozen yoghurt showed that the energy, protein, carbohydrate, iron, calcium, Polyphenol, flavanoid) content of the prepared frozen yoghurt were incorporation by fruits increased all the incorporation level of in all frozen yoghurts.

Table : Physico- chemical properties of the prepared fruit orange frozen yoghurt.

Product properties	Fruit orange frozen yoghurt
pH	5.04
Acidity	0.43
TSS	28
Overall Run	5.04

The products show an acceptable range in physicochemical characteristics. The pH is mainly towards the acidic side due to the product fruit orange frozen yoghurt. The products are fairly viscous as evident from the above table. This allows the product to be adequately acceptable to the people it has not much amount of total soluble solids which makes it suitable as a product.

VIII. SUMMARY

Orange fruit frozen yoghurt sensory score of T_0 (skimmed milk 70%, SMP3%, sugar 4.6%, 14.6%, SMP3%, emulsifier0.2%, stabilizer0.2% culture2%) and there was significant difference between the two. T_3 was found to be more acceptable than T_2 skimmed milk 65%, sugar 14.6%, SMP3%, culture 2%, emulsifier 0.2%, stabilizer0.2%) and T_0 control.

The nutrient calculation of prepared orange fruit frozen yoghurt showed that the energy, protein, carbohydrate, iron, calcium, Polyphenol, flavanoid) content of the prepared orange fruit frozen yoghurt were incorporation by fruits increased all the incorporation level of antioxidant and nutrient fruit frozen yoghurts.

IX. CONCLUSION

It is concluded that Skimmed milk fruit orange pulp is a rich source of antioxidant rich and prevent of free radicals, heart disease, cardiovascular disease, hyper tension, source of calcium, energy, carbohydrate, vitamin C, Polyphenol and Flavonoids, can be successfully incorporated in the preparation like orange fruit frozen yoghurt the treatment T_3 (orange pulp+ skimmed milk+ stabilizer + emulsifier +sugar) was the most acceptable of the prepare product in treatment increased as the incorporation level was increased in all food product in as well as improve their Nutritional content.

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