



# PHYSICO- CHEMICAL PROPERTIES OF ANTIOXIDANT RICH HEALTHY BEVERAGES PREPARED BY USING PINEAPPLE JUICE AND GUAVA LEAVES EXTRACTS FLAVOURED WITH HERABS (MINT AND BASIL)

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**ABSTRACT:** *The present study entitled “Preparation of antioxidant rich healthy beverages by using pineapple juice and guava leaves extract flavoured with herbs (mint and basil)” was undertaken to analyse the antioxidant content of prepared beverages. Two beverages were prepared using pineapple juice, guava leaf extract, herbs extract and dates and to calculate the antioxidant composition of the prepared beverages. Two recipes were prepared namely; “pineapple based beverage incorporated with guava leaf extract, mint extract, dates”, “pineapple based beverage incorporated with guava leaf extract, basil extract, dates” using the standard ingredients and method of preparation. The five treatments were T<sub>0</sub>(pineapple juice 92% and dates8%), T<sub>1</sub>(pineapple juice-88%, guava leaf extract-2%, mint 2% /basil 2 %, dates-8%), T<sub>2</sub>(pineapple juice-84%, guava leaf extract-4%, mint 4%/ basil 4%), dates 8%), T<sub>3</sub>(pineapple juice-80%, guava leaf extract-6%, mint 6%/ basil 6%), dates 8%), T<sub>4</sub>(pineapple juice-76%, guava leaf extract-8%, mint 8%/ basil 8%), dates 8%), T<sub>5</sub>(pineapple juice-72%, guava leaf extract-10%, mint 10 %/basil 10 %), dates 8 %). Pineapple based beverages incorporated with guava leaf extract, mint extract, dates was the best among the one beverages. The nutritional compositions of the beverages were evaluated through chemical analysis. The total carbohydrate content ranged from 22-24.25g/100 ml, energy content ranged from 98.45–104.7Kcal/100ml, vitamin C content ranged from 29.89 – 31 mg/100ml the highest being in beverage flavoured with basil.*

**Keywords -** *Pineapple juice, guava leaves extract and herbs extract, dates, acceptability, nine point hedonic scale.*



## INTRODUCTION

Pineapple is a wonderful tropical fruit having exceptional juiciness, vibrant tropical flavor and immense health benefits. Pineapple contains considerable amount of calcium, potassium, vitamin C, carbohydrates, crude fibre, water and different minerals that is good for the digestive system and helps in maintaining ideal weight and balanced nutrition. Pineapple is a common fruit in Bangladesh and it has minimal fat and sodium. Guava leaves are generally taken as tea mostly by the tropical countries. The leaves contain an antioxidant such as vitamin C. Pineapple is a wonderful tropical fruit having exceptional juiciness, vibrant tropical flavour and immense health benefits. Pineapple contains considerable amount of calcium, potassium, vitamin C, carbohydrates, crude fibre, water and different minerals that is good for the digestive system and helps in maintaining ideal weight and balanced nutrition. Pineapple is a common fruit in Bangladesh and it has minimal fat and sodium. Mint leaves are packed with nutrients such as calcium, phosphorous, vitamin C, D, E and small amounts of vitamin B complex. All these compounds put together improves the body's immune system, keeping it safe from infections and inflammation. **Hasler *et al.*, (2005)** reported that certain phytochemicals from herbs or herbal extracts (such as turmeric, basil and mint) have been shown to inhibit one or more of the stages of cancer process in animal model and in vitro studies. **Chand *et al.*, (2007)** reported that Pineapple (*Ananuscomosus*) is non-climacteric fruit grown widely in Meghalaya. It is rich in vitamin C, magnesium calcium, potassium, iron and the protein digesting enzyme, bromelain. Kew and Queen are the two promising cultivars of pineapple In North East India. Kew variety is characterized by the big sized fruits (1.5-2.5 kg) which are oblong and tapering slightly towards the crown. The flesh is light yellow and very juicy when ripe. Queen variety fruits are of the weight 0.9-1.3 kg in general. The flesh is deep golden-yellow less juicy than Kew, crisp textured with a pleasant aroma and flavour. Pineapple plants flower 10-12 months after planting and fruits become ready 16-18 months after planting. In natural condition it is harvested during May August. Fruits which mature in the winter are acidic. The fruits with crown can be kept for 10-15 days after harvesting. **Nokatoh (1999)** found that summer fruits of pineapple had higher total soluble solids than winter fruits and also observed that the flesh and the peduncle portion were richest in total soluble solids, reported that summer fruits of pineapple had lower ash content than winter fruits. The antioxidant mechanism of guava leaf extracts may be contributed to their radicals scavenging ability. Phenolic compounds appears to be responsible for the antioxidant activity of guava extracts (**Chen and Yen, 2006**).



## MATERIALS AND METHODS

This present investigation "**Preparation of antioxidant rich healthy beverage by using pine apple juice and guava leave extract flavoured with herbs (mint and basil)**" was conducted in the Nutrition Research Laboratory of Food Nutrition and Public Health Department. Ethelind College of Home Science, Sam Higginbottom University of Agriculture Technology & Sciences, Allahabad, U.P.

### 1. Study sample:-

Treatments and replications of antioxidant rich healthy beverage by using pineapple juice and guava leaves extract flavoured herbs (mint and basil) was as follows:

Tables no. 2.1

Treatments/Products	T <sub>0</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	T <sub>5</sub>	Replication 5
<b>Beverages -1</b>							
Pine apple juice	92	88	84	80	76	72	
Guava leave extract	-	2	4	6	8	10	
Mint	-	2	4	6	8	10	
Dates	8	8	8	8	8	8	
<b>Baverages-2</b>							<b>Replication 5</b>
Pineapple juice	92	88	84	80	76	72	
Guava leaves extract		2	4	6	8	10	
Basil		2	4	6	8	10	
Dates	8	8	8	8	8	8	



## PREPARATION OF THE BEVERAGE

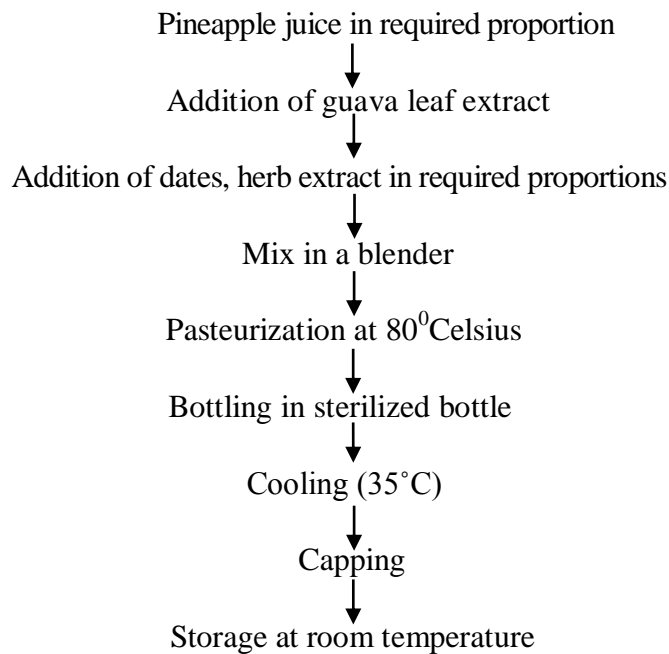


Fig .Flowchart for preparation of beverage. Source: **Srivastava (2009)**

**Nutrient calculation:** Nutritive value of the prepared herbal beverage is to be calculated using the value of raw ingredients used for preparation of antioxidant rich healthy beverage as given by **Gopalan *et.al.* (2014)**.

## NUTRITION COMPOSTION OF THE PRODUCT

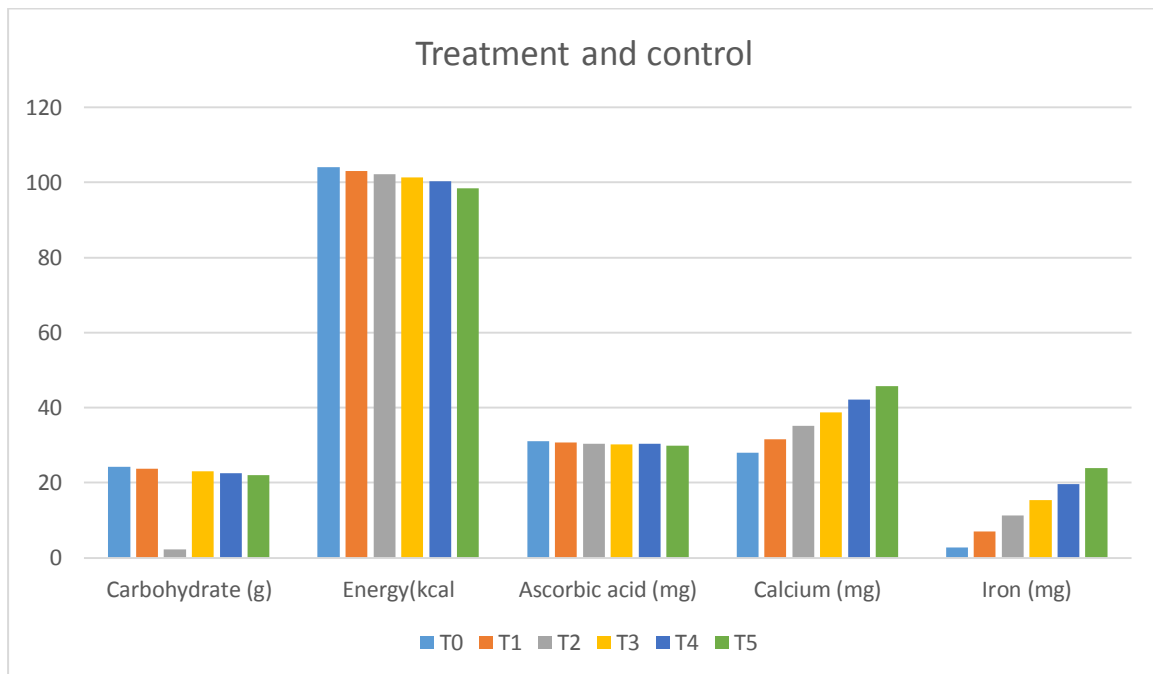
**TABLE 2.2 nutrient content in control and treated sample of pine apple fruit beverage with guava leaves extract, mint and dates.**

Treatment \ Nutrients	T0	T1	T2	T3	T4	T5
Carbohydrates(g)	24.25	23.64	23.28	23.03	22.54	22
Energy (kcal)	104.07	103.05	102.15	101.25	100.3	98.45
Ascorbic acid (mg)	31	30.71	30.45	30.16	30.4	29.89



Calcium (mg)	28	31.55	35.11	38.66	42.16	45.78
iron ( mg)	2.8	7.01	11.23	15.44	19.65	23.88

Carbohydrate and energy value decreases in treatment T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>.and T<sub>5</sub> gradually as compared to treatment T<sub>0</sub> (control), as the value of incorporation of guava leaf extract increases carbohydrate and energy value decreases. The iron and calcium content of T<sub>5</sub> is the highest that is, 45.78mg and 23.88mg respectively followed by T<sub>4</sub> T<sub>3</sub>, T<sub>2</sub> and T<sub>1</sub>. This has been noted to be the lowest for T<sub>0</sub> being 28mg and 2.8mg respectively. However the vitamin C value decrease marginally.



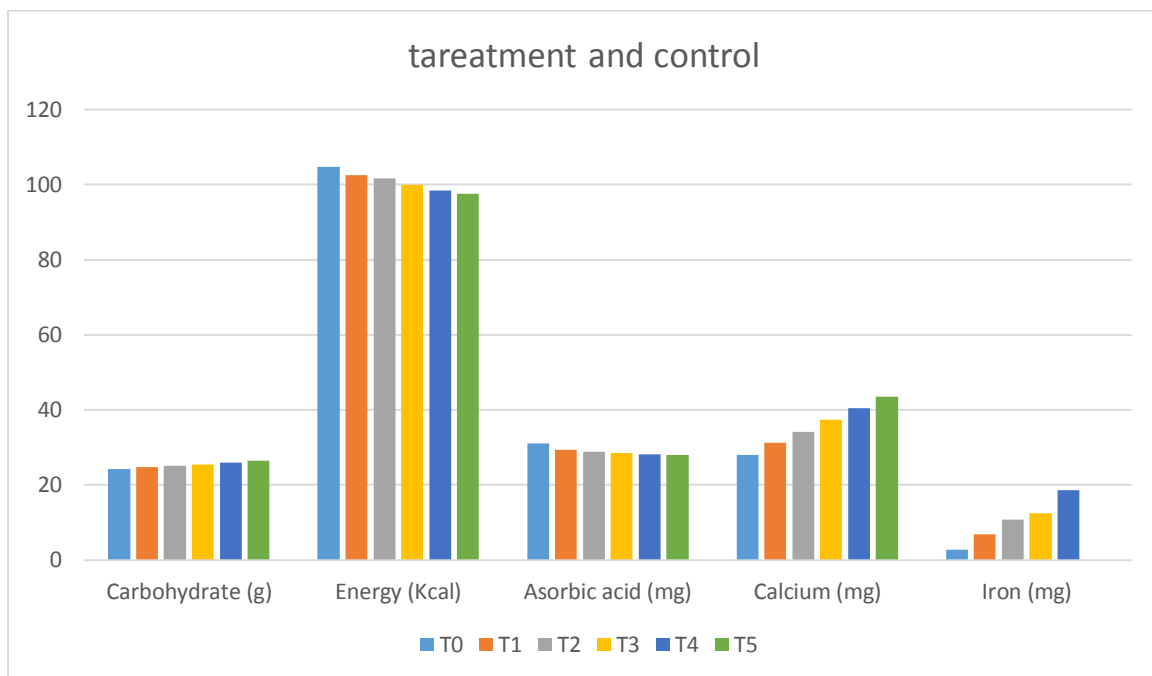
**Table 2.3 Nutrient content in control and treated sample of pine apple fruit beverage with guava leaves extract, basil and dates.**

Treatment \ Nutrients	T0	T1	T2	T3	T4	T5
Carbohydrate (g)	24.25	24.79	25.09	25.34	26.01	26.36
Energy (kcal)	104.7	102.5	101.66	99.89	98.4	97.6



Ascorbic acid (mg)	31	29.3	28.78	28.47	28.23	28
calcium (mg)	28	31.19	34.19	37.28	40.38	43.48
iron ( mg)	2.8	6.76	10.73	12.49	18.66	22.63

The carbohydrate increases from treatment T<sub>0</sub> 24.25 gm/100ml to treatment T<sub>5</sub> 26.36 gm./100 ml due to addition of basil. Vitamin C decreased from T<sub>0</sub> 31 mg / 100ml to T<sub>5</sub> 28 mg /ml.



**Table 2.4 Physico – chemical properties of the prepared beverage.**

Physico–chemical properties	Pineapple fruit beverage flavoured with mint	Pineapple fruit beverage flavoured with basil
pH	3.9	3.5
TSS	18.02	17.34
Viscosity	51.66	52

The product showed an acceptable an acceptable range in physic – chemical characteristics. The p<sup>H</sup> values indicates that the prepared beverage is acidic. Table 4.5



shows that the beverage was viscous and adds to the flavour and taste which enhances sensory acceptability by the panel of judges. The total soluble solids were considerably low which makes it acceptable as a beverage. Pineapple fruit beverage flavoured with mint and basil was more acidic and viscous as compared to the other beverage. However the total soluble content was considerably low.

### Conclusion

From the result summarized, it is concluded that Guava leaf extract can be suitably incorporated in antioxidant rich pineapple beverages flavoured with mint extract and with basil extract. The prepared beverages were well accepted with regards to sensory characteristics. In pineapple beverage flavoured with mint, Treatment T<sub>3</sub> (80% pineapple juice, 6% guava leaf extract, 6% mint, 8% dates) scored the highest in all aspects in hedonic scale. In second beverage (Basil) Treatment T<sub>2</sub> (84% pineapple juice, 4% guava leaf extract, 4% basil, 8% dates) scored the highest in all aspects in hedonic scale. Nutritional composition of antioxidant rich herbal flavoured value added pineapple beverages regarding total polyphenol content and total flavonoid content were increased significantly with increased percentage of guava leaf extract in both flavoured beverages. Carbohydrate, energy, calcium and iron content was considerably higher than control in prepared beverage flavoured with mint. However, carbohydrate, energy and vitamin C content in the prepared beverages flavoured basil were decreased but increased in iron and calcium.

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