UTILIZATION OF PINEAPPLE PULP IN PREPARATION OF PRESERVED FOOD PRODUCTS VALUE ADDED WITH DATES AND POMEGRANATES

Dutta Shilpi∗, Dubey Prakash Ritu∗ and Sheikh Sarita∗∗

ABSTRACT

The present study entitled "Utilization of Pineapple Pulp in preparation of preserved Food Product Value Added With Dates and Pomegranates" was carried out with the objectives to develop value added food product by utilization of pineapple pulp incorporation with dates and pomegranates as well as to determine organoleptic quality, to analyze the nutritional composition and cost of prepared food products. The prepared food products were Pineapple Chutney and Pineapple Cheese fortified with dates and pomegranates in different proportion and served as a treatment T1, T2, T3 and T4 respectively without incorporation of dates and pomegranates served as control. Chemical analysis of carbohydrate, protein, energy, fat, iron and vitamin C was done by standardized (AOAC 2005). Sensory evaluation was carried out using nine point Hedonic scale. Data obtained were statically analyzed by using analysis of variance (ANOVA), (t) test and critical difference (CD) technique. On the basis of findings, it was observed that in case of all the four value added products namely Pineapple Chutney and Pineapple Cheese (55:15:10:20) incorporation level scored the best with regard to color, body and texture, taste and flavor and overall acceptability. Four replications of control and treatment for all the two products were carried out and mean value were obtained. Enrichment with dates and pomegranates in product like Pineapple Chutney and Pineapple Cheese is well acceptable, based on sensory evaluation. In Pineapple Chutney T1 (tomato + pineapple + dates + pomegranates + jaggery + oil, 10:40:20:20:10:5) was the best. In Pineapple Cheese T4 (pineapple + dates + pomegranates + sugar + butter, 40:20:25:10:10) was the best. Pineapple cheese was rich in Fat T2 (8.485g/100g), and Energy T2 (178.068Kcal/100gm). Pineapple Chutney was rich in Vitamin C (31.82mg/100mg) and Iron (2.907mg/100mg). Addition of fresh pineapple, dates and pomegranates increased nutrient density of all prepared food products. The cost of the prepared food products per 100g of raw ingredients ranged from Rs. 5.00 - 8.50 for Chutney and Rs. 8.00 - 12.00 for Cheese.

Keywords: Pineapple pulp, Dates, Pomegranate, Iron, Vitamin C

INTRODUCTION

The minerals present at levels less than 0.05 percent in the human body are defined as the micro minerals. Micro minerals are also known as the trace element. Some micro minerals are important in our daily diet. Iron was first recognized as an essential element for the growth and development. Transport and storage of oxygen. Co-factor of enzymes and other proteins. Formation of red blood cells. Children and pre-menopausal women are the groups most prone to the disease. (Srilakshmi, 2012)

The pineapple (Ananas Comosus) is a tropical plant with edible multiple fruits consisting of coalesced berries. Pineapple is the second harvest of importance after bananas, contributing to over 20% of the world production of the tropical fruits. (Medina et al. 2005). Pineapple grow in countries which are situated in the tropical and sub-tropical regions. It is native to central and South America. Total pineapple production worldwide is around 16 to 18 million tons. There are several countries (e.g Thailand, Brazil, India, Phillipines and China) which contribute to the total production. Pineapple is an important food which can be eaten fresh or eaten in a processed form. It is composed of nutrients which are good for human health. This is due to researches carried out on the relationship between nutrients in pineapple and human health. Processing pineapple in industries can leave a lot of waste which can cause serious environmental problems. Researchers have been carried out recently to counteract this problem. Nutritive value of 100 gm pineapple contain energy 46 Kcal, carbohydrates 10.8g, sugar 09.85g, dietary fiber 1.4g, fat 0.1g, protein 0.4g, thiamine 0.54g, riboflavin 0.079mg, niacin 0.5mg, vitamin B6 0.112mg, vitamin C 47.8mg, folate (Vit B9) 18µg, iron 2.42mg. (Gopalan et al. 2007) Pine apple packed with vitamin and minerals, Prevent cough and cold, Strengthens bones, Keep gum healthy, Lower risk of macular degeneration, Alleviates arthritis, Improve digestion.

Date palm is highly nutritious fruits. It is rich in sugar, iron, potassium, calcium and nicotinic acid. 1kg of fully ripe fresh dates provides approximately 3,150 calories. The flesh of dates contain more than 2% fat, minerals 7-10 mg per 100g, iron 0.1%, calcium 0.3%, phosphorus 0.05-0.1% and pectin substance. (Gopalan et al. 2007). Dates contain 20-70 calories each depending on size and

∗Research Scholar, ∗Assistant Professor, ∗∗Professor and Dean
Department of Foods and Nutrition, Ethelind College of Home Science,
Sam Higginbottom University of Agriculture, Technology And Sciences, Prayagraj - 211007 (U.P.) India.
variety. It is one of the oldest fruit tree in the world and is mentioned in the Quran and Bible. The number of the date palms is about 100 million worldwide, of which 62 million palms can be found in the Arab world.

The date palm reaches an age of about 150 years. It’s grown primarily in dry, arid region, such as the Middle East and part of California. They give several nutritional benefits when eaten fresh and pitted. Dates are loaded with various nutrients, right from minerals like calcium, potassium, magnesium, iron etc. Vitamins like vitamin A, vitamin B complex, vitamin C etc. Dates are low in fat and high in protein and fiber content, which makes them healthy snacks between meals. (Marshall et al. 2003). Dates are Energy booster, Assists digestion, Helps heals intestinal disorder, Helps gain weight, Helps improves heart health, Rich in antioxidants, Dates keep anemia away.

The pomegranate botanical name (*Punica Granatum*), its belong to the family Punicaceae which includes only one genus and two species In recent years, it has become more common in the commercial in the commercial markets of North America and the Western Hemisphere. Pomegranates are used in cooking, baking, juices, smoothies and alcoholic beverages, such as martinis and wine. In scientific studies pomegranate has demonstrated remarkable health effects in humans, especially regarding the heart, brain and prostate. The special phytochemicals of the pomegranate, called "polyphenol", account for these valuable health effects. They balance the immune system and strengthen the antioxidant protective systems of humans. Nutritive value of 100 gm pomegranate contain energy 65 Kcal, carbohydrates 14.5g, sugar 13.67g, dietary fiber 4g, fat 0.1g, protein 1.6g, thiamine 0.067g, riboflavin 0.053mg, niacin 0.293mg, pantothenic acid (Vit B₆) 0.377mg, vitamin B₉ 0.75mg, vitamin C 10.2mg, folate (Vit B₉) 38µg, vitamin K 16.4µg, calcium 10mg, iron 1.79mg. (Gopalan et al. 2007). Pomegranates are Fights breast cancer; protect your arteries, Lowers cholesterol.

**MATERIALS AND METHODS**

Pineapple Pulp Dates and Pomegranates were used for the development of preserved foods product chutney and cheese. The basic recipe was standardized and served as control (T₀). In Chutney Four value added treatments i.e. incorporation with Pineapple pulp, Dates, Pomegranates Jaggery, Tomato and oil in the ratio 10:70:5:5:10, 10:60:10:10:5, 10:50:15:15:10 and 10:40:20:20:10 levels were referred to as T₁, T₂, T₃ and T₄ treatments respectively for Chutney. In Cheese four value added treatments i.e. incorporation with Pineapple pulp, Dates, Pomegranates Sugar and butter in the ratio 70:5:5:10:10, 60:10:10:10:10, 50:15:15:10:10 and 40:20:20:10:10 levels were referred to as T₁, T₂, T₃ and T₄ treatments respectively for Cheese. Four replications for control and each treatment were done respectively. The products Chutney, and Cheese were freshly prepared and evaluated oraganaleptically by a panel of 5 judges selected from Ethelind College of Home Science, SHUATS, Prayagraj.

The judges were requested to score the products with the help of score cards based on the nine point hedonic scale (Srilakshmi, 2007). The products were judged for the qualities such as colour and appearance, body and texture, taste and flavor and overall acceptability. The mean scores for each product and each treatment were calculated. The data obtained from sensory evaluation were statistically analyzed by variance technique. Significant difference between the treatments was determined by using CD (critical differences) test. Standard error of each treatment and data of chemical analysis were also calculated (Gupta et al. 2002).

Details of Control and Treatment combination-
Pineapple, Dates and Pomegranates were used to make all the three preserved food products.

**Chutney**

- **Control (T₀)** = Chutney prepared with only tomato, pineapple and standard ingredients without value addition of dates and pomegranates.
- **Treatment (T₁)** = Chutney prepared with tomato, jaggery, pineapple dates and pomegranates in a ratio of 10:70:5:5:10.
- **Treatment (T₂)** = Chutney prepared with tomato, jaggery, pineapple dates and pomegranates in a ratio of 10:60:10:10:5.
- **Treatment (T₃)** = Chutney prepared with tomato, jaggery, pineapple dates and pomegranates in a ratio of 10:50:15:15:10.
- **Treatment (T₄)** = Chutney prepared with tomato, jaggery, pineapple dates and pomegranates in a ratio of 10:40:20:20:10.

**Flow diagram of preparation of pineapple chutney**

1. Tomato, pineapple, dates and pomegranate (fully ripe)
2. Washing
3. Sorting
4. Cutting into small pieces
5. Crushing
6. Addition of all ingredients except salt and sugar and cook gently to desired consistency
7. Addition of salt and sugar and cook for 5 minutes
8. Filling in sterilized glass bottle
9. Sealing
10. Storage at ambient temperature (cool and dry place)


**Cheese**

- **Control (T₀)** = Cheese prepared with only pineapple, sugar, butter and standard ingredients without value addition of dates and pomegranates.
- **Treatment (T₁)** = Cheese prepared with pineapple dates, pomegranates, sugar and in a ratio of 70:5:5:10:10.
- **Treatment (T₂)** = Cheese prepared with pineapple dates, pomegranates, sugar and in a ratio of 60:10:10:10:10.
- **Treatment (T₃)** = Cheese prepared with pineapple dates, pomegranates, sugar and in a ratio of 50:15:15:10:10.
- **Treatment (T₄)** = Cheese prepared with pineapple dates, pomegranates, sugar and in a ratio of 40:20:20:10:10.
Replications - Control and each of the treatments for each product were replicated four times.

Flow diagram of preparation of pineapple chutney:

- Tomato, pineapple, dates and pomegranate (fully ripe)
- Washing
- Cutting into the pieces
- Boiling with equal quantity of water (to soften the pulp)
- Addition of all ingredients except salt and sugar and cook gently to desired consistency
- Sieving (to remove skin)
- Addition of sugar, citric acid and butter in pulp
- Mixing thoroughly
- Cooking till sufficient thick
- Adding salt and color
- Remove from fire (when mass start leaving side of pan)
- Spread hot cheese in 0.6 cm thick layer on tray smeared with butter
- Allowing cooling and setting
- Cutting into small pieces
- Wrapping in butter paper or polythene sheet
- Store in air tight container
- Filling in sterilized glass bottle
- Storage at ambient temperature (cool and dry place)


RESULTS AND DISCUSSION

The results obtained by analysis of data are given below:

Table no. 1. Average sensory scores of different parameters in control and treated sample of 'Chutney'.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Color and appearance</th>
<th>Body and Texture</th>
<th>Taste and flavor</th>
<th>Overall acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&lt;sub&gt;n&lt;/sub&gt; (Control)</td>
<td>6.85±0.147</td>
<td>6.85±0.108</td>
<td>7.6±0.37</td>
<td>7.09±0.095</td>
</tr>
<tr>
<td>T&lt;sub&gt;1&lt;/sub&gt;</td>
<td>7.35±0.163</td>
<td>7.5±0.18</td>
<td>7.7±0.33</td>
<td>7.51±0.075</td>
</tr>
<tr>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
<td>7.8±0.223</td>
<td>7.8±0.22</td>
<td>8.65±0.25</td>
<td>7.59±0.156</td>
</tr>
<tr>
<td>T&lt;sub&gt;3&lt;/sub&gt;</td>
<td>8.15±0.204</td>
<td>8.3±0.11</td>
<td>8.6±0.37</td>
<td>8.36±0.104</td>
</tr>
<tr>
<td>T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>8.25±0.192</td>
<td>8.6±0.1</td>
<td>8.4±0.46</td>
<td>8.43±0.081</td>
</tr>
<tr>
<td>F%</td>
<td>13.23(S)</td>
<td>24.45(S)</td>
<td>0.522 (NS)</td>
<td>57.91 (S)</td>
</tr>
<tr>
<td>C.D</td>
<td>0.490</td>
<td>0.427</td>
<td>-</td>
<td>0.233</td>
</tr>
</tbody>
</table>

S = Significant, NS = Non-Significant, ± = S.E

Table no. 2. Average sensory scores of different parameters in control and treated sample of 'Cheese'.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Color and appearance</th>
<th>Body and Texture</th>
<th>Taste and flavor</th>
<th>Overall acceptability</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&lt;sub&gt;n&lt;/sub&gt; (Control)</td>
<td>7.25±0.17</td>
<td>7.15±0.108</td>
<td>7.65±0.16</td>
<td>7.3±0.46</td>
</tr>
<tr>
<td>T&lt;sub&gt;1&lt;/sub&gt;</td>
<td>7.75±0.36</td>
<td>7.7±0.15</td>
<td>8±0.18</td>
<td>7.8±0.54</td>
</tr>
<tr>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
<td>7.85±0.082</td>
<td>8.2±0.18</td>
<td>8.5±0.21</td>
<td>7.9±0.56</td>
</tr>
<tr>
<td>T&lt;sub&gt;3&lt;/sub&gt;</td>
<td>7.95±0.35</td>
<td>7.8±0.18</td>
<td>8.05±0.32</td>
<td>8±0.35</td>
</tr>
<tr>
<td>T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>8.4±14</td>
<td>8.4±0.141</td>
<td>8.7±0.22</td>
<td>8.1±0.54</td>
</tr>
<tr>
<td>F%</td>
<td>29.652(S)</td>
<td>8.31(S)</td>
<td>3.58(S)</td>
<td>3.72(S)</td>
</tr>
<tr>
<td>C.D</td>
<td>0.233</td>
<td>0.517</td>
<td>0.615</td>
<td>0.58</td>
</tr>
</tbody>
</table>

S = Significant, ± = S.E

In case of 'Pineapple Chutney', T<sub>4</sub> (10:40:20:2220:10,) was best in color and appearance (8.25), body and texture (8.6), and Overall acceptable (8.4), T<sub>1</sub> (10:60:10:10:10) was best in taste and flavor (8.65). The result is supported by the findings of (Frazziar and Westheff, 1978), that the incorporation of dates and pomegranate from the result can be shows that the treatment T<sub>4</sub> was most acceptable among all treatments on the basis of calculated value of F (57.91) which was higher than the table value F (3.26) at 5% probability level. The mean scores of Pineapple Chutney in relation to overall acceptability indicate that the treatment T<sub>4</sub> scored maximum followed by treatment T<sub>3</sub>, T<sub>2</sub>, T<sub>1</sub> and T<sub>n</sub> respectively. It is seen that addition 20% of dates and 20% of pomegranates in the treatment T4 improved overall acceptability of pineapple Chutney.

In case of 'Pineapple Cheese', T<sub>4</sub> (40:20:20:10:10) scores of best with regard to all sensory characteristics viz. colour and appearance (8.4), body and texture (8.4), taste and flavor (8.7) and overall acceptability (8.1). The result is supported by the findings of (Suresh et al., 2003) that the T<sub>4</sub> was most acceptable among all treatments calculated value of F (3.75) which was higher than the table value F (3.26) at 5% probability level. The mean scores of Pineapple Cheese in relation to overall acceptability indicate that the treatment T<sub>4</sub> scored maximum followed by treatment T<sub>2</sub>, T<sub>1</sub>, T<sub>3</sub> and T<sub>n</sub> respectively. It is seen that addition 20% of dates and 20% of pomegranates in the treatment T4 improved overall acceptability of Pineapple Cheese.

ACKNOWLEDGEMENT

I would like to express my heartiest and profound gratitude towards my Advisor Dr. (Mrs.) Ritu Prakash Dubey Sheikh, Assistant Professor (Sr.Sc) and my Co-Advisor Dr. (Mrs.) Sarita Sheikh Professor and Dean for her valuable suggestions and affectionate encouragement throughout this thesis work.

CONCLUSION

From the result summarized above, it is concluded that pineapple, dates and pomegranates can be suitably be incorporated in 'Chutney', 'Jam' and 'Cheese'. The prepared products were accepted with regard to sensory characteristics. Treatment (T<sub>4</sub>) containing pineapple, dates, pomegranates, tomato and jaggery in the ratio 40:20:20:10:10 respectively in chutney, in Cheese (T<sub>4</sub>) containing pineapple, dates, pomegranates, sugar and butter in the ratio 40:20:20:10:10 were acceptable in all prepared foods products.
REFERENCES


