Preparation of health beverage from sweet orange juice blended with Aloevera

Jayshree Panday, Shanker Suwan Singh and Narendra Nath

Abstract

Maintenance of optimal nutrition and positive health of the population through assured nutrient intake continues to be a national priority for a nation to be healthy strong and productive, the nutritional status of its people must be good in the new millennium we are replacing the upward trained in nutritional an health awareness which has increased the consumer demand for functional food. The present investigation was made with an attempt to develop a beverage by orange juice and addition with herbal medicine aloevera. Treatment T1 was standardized to 95% of orange juice and 5% of aloevera, T2 was standardized to 90% of orange juice and 10% of aloevera, T3 was standardized to 85% of orange juice and 15% of aloevera, physical-chemical analysis was done for estimating its nutritional contents, microbial analysis like SPC (slandered plate count) and coli form count for product safety and organoleptic like (flavour and taste, colour and appearance, consistency) by trained panellist using 9 point hedonic scale. The treatments containing 90% orange juice and 10% aloevera juice score the highest value. Thus based on Physico-chemical, microbial and organoleptic evaluation the treatment can be rated as T2>T0>T1>T3.

Keywords: Health beverage, sweet orange juice, Aloevera, Physico-chemical

Introduction

Fruit juices are common beverages in many countries of the world. In hot climate area, cafes, restaurants and road side stalls have local facilities to extract the juice from fresh fruits and then serving the juice liberally dozed with ice, to thirsty customers. Fruit juices processed under hygienic condition could play important role in enhancing consumer’s health through inhibition of breast cancer, congestive heart failure (CHF), and urinary tract infection. Apart from nutritional quality improvement, beverages can be improved in its sensory and flavour characteristics according to their raw materials

100% fruit juices are a smart addition to any well-balanced diet, providing vitamins and minerals like potassium, vitamin c and foliate. Fruit juice is also a convenient way for adults and children to help reach the recommended number of daily serving of fruits and vegetables. Just one 4-ounce glass of 100% juice provided a full serving of fruit.

Juice is a liquid that is naturally contained in fruit and vegetables. It can also refer to liquid that are flavoured with these or other biological food sources such as meat and seafood. It is commonly consumed as a beverage or used as an ingredient or flavouring in food. Sometimes two or more juices are mixed to yield a well blanced, rightly flavoured highly palatable and refreshing drink. Fruit beverages are easily digestible, highly refreshing, thirst quenching, appetizing and nutritionally far superior to many synthetic and aerated drinks.

Sugar is in a lot of so called healthy energy drinks nowadays. When I say sugar I mean regular processed sugar, the same thing found in those sugary soft drinks. While staple juices like apple and orange have remained popular for decades, many new and exotic juice choices have entered the marketplace in recent years, such as pomegranate, mango, strawberry, grape, banana, cranberry, guava, kiwi and more. In addition to these varieties, beverages producers are now creating new and innovative juice combinations.

Popular Indian variety of sweet orange (Citrus sinensis) comes under the family of Rutaceae sweet oranges introduced in India during 13th century from south east Asian countries. The term orange drink refers to sweet, sugary, orange flavoured drink. Typically such beverages contain little to no orange juice and are not much more than water, sugar, flavour, coloring and additives. Popular orange drinks include sunny delight, tang and orange squash.

Orange juice is universal fruit eaten all over the world for pleasure & health. Among all fruit juice orange juice is suitable for all ages & can be safety given in all kinds of diseases.
Particularly in fevers like typhoids, tuberculosis, measles etc. Orange juice is most ideal liquid food to give energy, to increase urinary output & body resistance against infections & health recovery. The fruit is generally used for table purpose as well as for making juice, squash, crush, syrup & concentrate. Some by-products are also prepared, essential oil and pectin. Juice is abundant having good content of sugar & vitamin c with pleasant flavour. (Chandler and Robertson 1998)

Nutritional Composition of Sweet Orange

<table>
<thead>
<tr>
<th>Constituent</th>
<th>PER 100 gm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>11.54 gm</td>
</tr>
<tr>
<td>Protein</td>
<td>0.70 mg</td>
</tr>
<tr>
<td>Fat</td>
<td>0.21 gm</td>
</tr>
<tr>
<td>Calcium</td>
<td>43 mg</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>12 mg</td>
</tr>
<tr>
<td>Iron</td>
<td>0.09 mg</td>
</tr>
<tr>
<td>Vitamin c</td>
<td>45 mg</td>
</tr>
</tbody>
</table>

Aloe Vera (Aloe barbadensis) plant was originated 500 year it belongs to lily family and look like a cactus. Aloevera plant was initially cultivated in the continent of African then it is found in other countries such as Mexico, Venezuela and India. Aloe vera is known as Gheekanwair or ghi-kuvar in Hindi & has been use since ages as folk medicine. It grows in Maharashtra & Tamil Nadu states where as Andhra Pradesh, Gujarat & Rajasthan states are known for its cultivation. Aloe vera is a perennial plant of liliaceae family with turgid green leaves joined at the stem in a rosette pattern. Aloe vera leaves are formed by a thick epidermis (skin) covered with cuticle surrounding the mesophyll, which can be differentiated into chlorenchyma cells and thinner walled cells forming the parenchyma.

Nutritional Value of Aloevera

<table>
<thead>
<tr>
<th>Composition</th>
<th>PER 100 gm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>1.2 gm</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>3.5 mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>6 gm</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>1.0 mg</td>
</tr>
<tr>
<td>Zinc</td>
<td>14.4 mcg</td>
</tr>
<tr>
<td>Calcium</td>
<td>9.0 mg</td>
</tr>
<tr>
<td>Copper</td>
<td>7.3 mcg</td>
</tr>
<tr>
<td>protein</td>
<td>0.89 mcg</td>
</tr>
<tr>
<td>Potassium</td>
<td>322 mg</td>
</tr>
</tbody>
</table>

Aloevera juice is found to prevent human pulmonary carcinogenic as well as it is effective in treating inflammatory bowl diseases. Aloevera juice can reduce blood sugar level in diabetic patient and can be used to relieve dental pain some studies that Aloevera can be used in the treatment of HIV-AIDS. It is proved beyond any doubt that regular use of oranges, events one from attack of common cold, influenza & bleeding, tendencies keeps healthy, strong & helps ones to live long. Aloevera is used widely in Dermatology, as it acts as an astringent, moisturizer, humidifier and cleaner. It softens the skin, diminishes wrinkles and cures acne, seborrhoea, herpes, red spots, psoriasis, eczema, mycosis, fever blisters, skin irritation and provides protection to the skin against pollution.

Materials and Methods

The Experiment “Preparation of health Beverage from sweet orange juice from blended with Aloevera” were carried out in a research lab of “Warner School of Food And Dairy Technology” Sam Higginbottom Institute of Agriculture Technology And Science Deemed to be University, Allahabad. The Experimental Beverages Samples were tested and statistically analysed. The detail of experimental techniques during the course of present investigation was studied under the following headings.

i) Materials required for preparation of control an experimental beverage.

ii) Procurement and Collection of Ingredients.

iii) Detailed procedure for manufacturing & experimental health beverage.

iv) Preparation of Treatments.

Materials Required

Fruits

- Fully matured, ripened, fresh and free from pests and disease, were procured from the local market of Allahabad.

- Sweet orange

- Aloevera

- Lemon

Sugar

- Good Quality of sugar, free from moisture white in colour procures from local market of Allahabad.

Chemicals

- Sodium Benzoate
- Nutrient agar
- Mackonkey Agar
- Oxalic Acid
- Ascorbic Acid
- Metaphosphoric Acid
- Concentrated sulphuric Acid

Flowchart for Preparation of Sweet Orange Juice
Flowchart for Preparation of Sweet Aloevera Juice

Aloevera Leaves

Surface sterilization with hot air oven

Removed of skin

Pulping by screw type pulper

Filtration through muslin cloth

Collect the clear Aloevera Juice

Plan of Work

Flow diagram adopted for manufacturing control & experimental health beverage

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Treatment 1 (T₀)</th>
<th>Treatment 2 (T₁)</th>
<th>Treatment 3 (T₂)</th>
<th>Treatment 4 (T₃)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Physic-Chemical analysis (in present)</td>
<td>2</td>
<td>19.40</td>
<td>19.00</td>
<td>18.80</td>
</tr>
<tr>
<td>TSS%</td>
<td>20.20</td>
<td>20.20</td>
<td>20.00</td>
<td>19.80</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>20.38</td>
<td>26.70</td>
<td>31.92</td>
<td>34.62</td>
</tr>
<tr>
<td>pH</td>
<td>5.40</td>
<td>5.30</td>
<td>4.88</td>
<td>4.66</td>
</tr>
<tr>
<td>Ash</td>
<td>0.45</td>
<td>0.44</td>
<td>0.44</td>
<td>0.43</td>
</tr>
<tr>
<td>Alcoholic Acidity</td>
<td>0.61</td>
<td>0.40</td>
<td>0.39</td>
<td>0.25</td>
</tr>
<tr>
<td>5. Microbiological analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPC x 10³ cfu/gm</td>
<td>4.80</td>
<td>11.40</td>
<td>12.60</td>
<td>13.00</td>
</tr>
<tr>
<td>Coliform Count</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>6. Organoleptic Score (9-Point hedonic scale)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color and appearance</td>
<td>8.15</td>
<td>7.80</td>
<td>7.80</td>
<td>7.50</td>
</tr>
<tr>
<td>Consistency</td>
<td>7.90</td>
<td>7.70</td>
<td>8.18</td>
<td>7.40</td>
</tr>
<tr>
<td>Flavor and taste</td>
<td>8.05</td>
<td>7.65</td>
<td>7.70</td>
<td>7.35</td>
</tr>
<tr>
<td>Overall Acceptability</td>
<td>7.77</td>
<td>7.74</td>
<td>8.10</td>
<td>7.28</td>
</tr>
<tr>
<td>Cost analysis</td>
<td>Cost in Rs./100g</td>
<td>53.29</td>
<td>50.79</td>
<td>48.29</td>
</tr>
</tbody>
</table>
Result and Discussion

TSS Percentage
There was significant difference in TSS were observed in different treatment combination. Maximum TSS of 20.20% was found in the T0 followed by T1 (19.40), T2 (19.00), T3 (18.80).
The difference in TSS was due to the compositional difference of health beverage and Aloevera which were used in different proportion in different treatments.

Ash percentage
There was significant difference in ash content of different treatment combinations. Maximum ash percent was recorded in the sample of T0 (0.45) followed by T1 (0.44), T2 (0.44) and T3 (0.43).
The difference in ash was due to the composition difference of health beverage and aloevera juice which are used in different propositions in different treatments.

Alcoholic acidity percentage
There was significant difference in alcoholic acidity content of different treatment combinations. Maximum alcoholic acidity percent was recorded in the sample of T0 (0.61%) followed by T1 (0.40), T2 (0.39), & T3 (0.25).
The difference in ascorbic acid was due to the composition difference of health beverage and aloevera juice which are used in different propositions in different treatments.

Ascorbic acid percentage
There was significant difference in Ascorbic acid content of different treatment combinations. Maximum Ascorbic acid percent was recorded in the sample of T0 (34.62%) followed by T1 (31.92), T2 (26.70), & T3 (20.38).
The difference in ascorbic acid was due to the composition difference of health beverage and aloevera juice which are used in different propositions in different treatments.

pH
There was significant difference in pH content of different treatment combinations. Maximum pH percent was recorded in the sample of T0 (5.40) followed by T1 (5.30), T2 (4.88), & T3 (4.66).
The difference in pH was due to the composition difference of health beverage and aloevera juice which are used in different propositions in different treatments.

Organoleptic Analysis

Color and appearance
There was significant difference in color and appearance score of different treatment combinations. Maximum percent was recorded in the sample of T0 (8.15) followed by T1 (7.80), T2 (7.80) and T3 (7.50).

Flavor and taste
There was significant difference in flavor and taste score of different treatment combinations. Maximum percent was recorded in the sample of T0 (8.05) followed by T2 (7.70), T1 (7.65) and T3 (7.35).

Consistency
There was significant difference in Consistency score of different treatment combinations. Maximum percent was recorded in the sample of T2 (8.18) followed by T0 (7.90), T1 (7.70) and T3 (7.40).

Overall acceptability score: There was non-significant difference in overall acceptability score of different treatment combinations. Maximum percent was recorded in the sample of T2 (7.10) followed by T3 (7.77), T1 (7.74) and T3 (7.28).

Microbial Parameters

SPC (x10^3 cfu/ml)
From the perusal of data on standard plate count in samples of different treatments and control the highest mean for SPC recorded in the health beverage in T3 (13.00) followed by T2 (12.60), T1 (11.40), & T0 (4.80).

Coli form count (x10^7)
In each treatment of health beverage the coli form count was nil.

Conclusion
The results obtained from the statistical analysis revealed that sweet orange & aloevera can be satisfactorily added together for making beverage. According to analysis of different treatments T2 (90% orange juice & 10% Aloevera juice) was found to best in terms of organoleptic, chemical, microbial & cost analysis.

References