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Jayshree Panday
M.Sc. (Food Tech) Student
Warner College of Dairy
Technology, SHUATS, Naini,
Allahabad, Uttar Pradesh, India

Shanker Suwan
Assistant Professor Warner
College of Dairy Technology,
SHUATS, Naini, Allahabad,
Uttar Pradesh, India

Narendra Nath
M.Sc. (Food Tech) Student
Warner College of Dairy
Technology, SHUATS, Naini,
Allahabad, Uttar Pradesh, India

Preparation of health beverage from sweet orange juice blended with Aloe vera

Jayshree Panday, Shanker Suwan Singh and Narendra Nath

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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 trend in nutritional 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 aloe vera. Treatment T1 was standardized to 95% of orange juice and 5% of aloe vera, T2 was standardized to 90% of orange juice and 10% of aloe vera, T3 was standardized to 85% of orange juice and 15% of aloe vera, physical-chemical analysis was done for estimating its nutritional contents, microbial analysis like SPC (standard 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% aloe vera 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, Aloe vera, 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 blended, 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, beverage 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 safely given in all kinds of diseases.

Correspondence
Jayshree Panday
M.Sc. (Food Tech) Student
Warner College of Dairy
Technology, SHUATS, Naini,
Allahabad, Uttar Pradesh, India

Particularly in fevers like typhoids, tuberculosis, measles etc. Orange juice is most ideal liquid food to given 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

Constituent	PER 100 gm
Carbohydrates	11.54 gm
Protein	0.70 mg
Fat	0.21 gm
Calcium	43 mg
Phosphorus	12 mg
Iron	0.09 mg
Vitamin c	45 mg

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 Gheekanwar 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 Aloe vera

Composition	PER 100 gm
Carbohydrate	1.2 gm
Vitamin C	3.5 mg
Sodium	6 gm
Vitamin A	1.0 mg
Zinc	14.4 mcg
Calcium	9.0 mg
Copper	7.3 mcg
protein	0.89 mcg
Potassium	322 mg

Aloevera juice is found to prevent human pulmonary carcinogenic as well as it is effective in treating inflammatory bowl diseases. Aloe vera juice can reduce blood sugar level in diabetic patient and can be used to relieve dental pain some studies that Aloe vera 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.

- Materials required for preparation of control an experimental beverage.
- Procurement and Collection of Ingredients.
- Detailed procedure for manufacturing & experimental health beverage.
- Preparation of Treatments.

Materials Required

Fruits

Fully matured, ripened, fresh and free from pests and disease, were procured from the local market of Allahabad. The fruits taken for the study were

- Sweet orange
- Aloevera
- Lemon

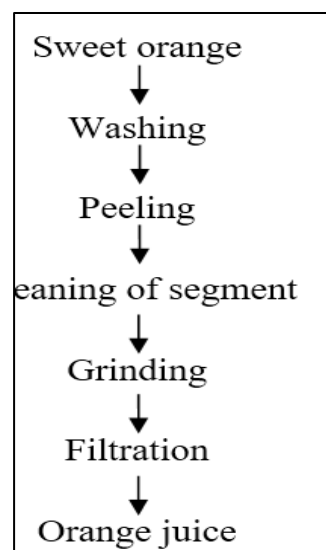
Sugar

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

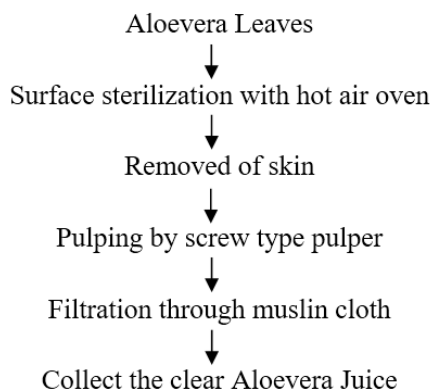
Chemicals

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

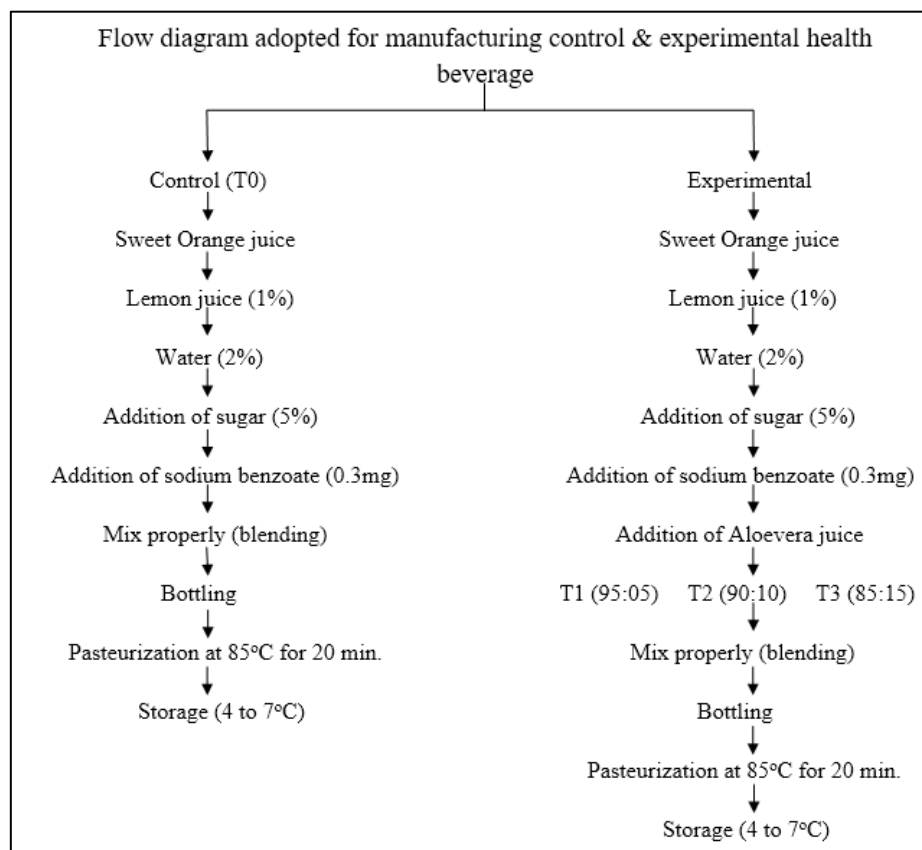
Flowchart for Preparation of Sweet Orange Juice



Flowchart for Preparation of Sweet Aloe vera Juice



Plan of Work



Parameters	Treatments			
	T ₀	T ₁	T ₂	T ₃
1. Physic- Chemical analysis (in present)	2.	3.	4.	
TSS%	20.20	19.40	19.00	18.80
Ascorbic acid	20.38	26.70	31.92	34.62
pH	5.40	5.30	4.88	4.66
Ash	0.45	0.44	0.44	0.43
Alcoholic Acidity	0.61	0.40	0.39	0.25
5. Microbiological analysis				
SPC x 10 ³ cfu/gm	4.80	11.40	12.60	13.00
Coliform Count	Nil	Nil	Nil	Nil
6. Organoleptic Score (9-Point hedonic scale)				
Color and appearance	8.15	7.80	7.80	7.50
Consistency	7.90	7.70	8.18	7.40
Flavor and taste	8.05	7.65	7.70	7.35
Overall Acceptability	7.77	7.74	8.10	7.28
Cost analysis				
Cost in Rs./100g	53.29	50.79	48.29	45.79

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 Aloe vera 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 aloe vera juice which are used in different proportions 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 alcoholic acidity was due to the composition difference of health beverage and aloe vera juice which are used in different proportions 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 T₃ (34.62%) followed by T₂ (31.92), T₁ (26.70), & T₀ (20.38).

The difference in ascorbic acid was due to the composition difference of health beverage and aloe vera juice which are used in different proportions 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 aloe vera juice which are used in different proportions 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 (8.10) followed by T₀ (7.77), T₁ (7.74) and T₃ (7.28).

Microbial Parameters

SPC (x10³ 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 (x 10²)

In each treatment of health beverage the coli form count was nil.

Conclusion

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

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