

DEVELOPMENT OF READY TO SERVE BEVERAGE (RTS) FROM A BLEND OF ORANGE, ALOE VERA AND MINT

NAKKA CHARAN KUMAR*¹ AND PUNEET ARORA²

¹Department of Dairy Technology, WCDT, SHUATS, Prayagraj, U.P., India

²Department of Dairy Trade & Business Management, SHUATS, Prayagraj, U.P., India

^{1,2}Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology & Sciences (SHUATS), Prayagraj, U.P., India

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Abstract– The demand for health beverages is growing in the soft drink industry. The functional properties and health benefits of Orange, Aloe vera and Mint are known worldwide. Blending RTS beverages with fruit has several benefits, including increased nutrient content, improved taste, and reduced sugar content. Fruits are a rich source of vitamins, minerals, and antioxidants, which can provide numerous health benefits. The addition of fruits can also help reduce the need for added sugars, as fruits provide natural sweetness to the beverage. In present study the efforts have been made to prepare ready-to-serve (RTS) made from a blend of Orange, aloe vera and mint fruit juice. Orange juice is rich in vitamin C, which boosts the immune system and helps to prevent diseases. Aloe vera is known for its anti-inflammatory properties and is also rich in vitamins and minerals. Mint is a natural digestive aid and can help to relieve stomach discomfort. Four formulations were tried with Orange, aloe vera and mint. Optimized formulation was found to be in the treatment which has 97% orange, 1% aloe vera and 2% cornsilk mint. The proximate analysis of the product showed an average of 4.85 pH, 16.4% Total Solids, 0.20% Fat, 0.71% Protein, 13.82% Carbohydrates, 0.45% Ash, 0.95% Acidity, 12.01 mg Ascorbic acid, 11.08 mg Calcium, 194 mg Potassium. Sensory attributes like colour and appearance, flavour score, consistency and overall acceptability for the prepared RTS beverage (200 ml) of optimized formulation (T1) is found best. While, there was a decreasing trend of ascorbic acid, Total sugar and organoleptic score due to aloe vera and mint contain compounds that can interact and cause it to degrade more quickly.

INTRODUCTION

RTS beverage stands for “Ready-to-Serve” beverage, and it refers to any drink that is pre-packaged and ready to consume without requiring any additional preparation. RTS beverages come in a variety of flavors and types, including juices, soft drinks, sports drinks, tea, coffee, and more.

Ready-to-serve (RTS) beverages made up of fruit pulp have a greater amount of water that is useful for body balancing by preventing dehydration. Fruit drinks contain a high percentage of sugar and provide a few vitamins and minerals. The consumption of fruit-based beverages in the form of fruit blends and smoothies is increasing due to public awareness on the presence of various functional ingredients beneficial to health. The

limited intake of free sugars below 10% of total energy intake constitutes a healthy diet and further reduction to < 5% of total energy intake will result in additional health benefits.

Orange (*Citrus sinensis*) is a citrus fruit that is widely cultivated and consumed all over the world. It belongs to the family of Rutaceae. Oranges are believed to have originated in Southeast Asia and are now grown in many parts of the world, including the United States, Spain, Brazil, and Italy. Oranges are widely consumed fruit, particularly appreciated for its fresh flavor, vitamin C, and its natural antioxidants source having health benefits. Orange juice is rich in vitamin C, folic acid, potassium and an excellent source of bioavailable antioxidant phytochemicals. Fruit juices are important trade commodities in most countries. Orange, like other

¹M.Sc. Scholar, ²Assistant Professor & Incharge)

citrus fruits, is known for vitamin C content. Due to this high amount of vitamin C, oranges help in absorbing calcium into the body and maintaining the health of teeth and bones. It also contains vitamin A vitamin B. 100 g of orange contains about 60 calories. This energy is available in the form of sugar which can be absorbed by the body easily. Hence orange juice is often fed to people who have become weak due to some illness. Orange juice is also a good refresher after a long exhausting day.

Aloe vera (*Aloe barbadensis* Miller) traditionally being utilized as a contemporary folk remedy belongs to the Lileacea family. More than 250 species of Aloe vera are reported around the globe, however, only two species viz. *A. barbadensis* Miller and *A. arborescent* are considered important for their medicinal value. Fresh Aloe vera leaves are composed of two components, first the bitter yellow latex, called Aloe vera sap and second the mucilaginous gel.

Gel is found to possess various biological activities and functional properties and so, its use has been increased in cosmetics and health care. It is also considered as a valuable ingredient for food application due to its biological activities and functional properties. Various studies have revealed that Aloe vera possesses many pharmaceutical activities including antimicrobial antioxidant, anticancer, antiulcer, hepatoprotective, antidiabetic Immunomodulatory and many more which are attributed to polysaccharides contained in the gel of leaves. Problem is the bitter taste of raw Aloe vera which makes it unpleasant to consume (Kausar *et al.*, 2020). Aloe vera has many medicinal uses. It has been observed through research that taking aloe vera in food or drink has reduced the glucose level in the blood which has been useful in controlling diabetes. It has also been used in anti-aging and anti-wrinkle creams and moisturizers.

Peppermint (*Mentha piperita* L.), belonging to the Labiatae family, is a large family of annual or perennial, herbaceous plants of 30-100 cm height, which is cultivated in temperate climates, in America, Europe and Asia. Mint is one of the most important and common flavors in the world coming after vanilla and citrus flavors (Straumite *et al.*, 2015). Mint has been reported to have pharmacological effects such as antimicrobial, anti-inflammatory, antispasmodic, antitussive, anticancer and analgesic. It contains minerals like calcium, potassium, sodium, magnesium, phosphorus and iron, as well as Vitamin A, C, K, folic acid, thiamine,

riboflavin and niacin (Raghavan, 2006). Mint was originally used as a medicinal herb to treat stomach ache and chest pains.

MATERIALS AND METHODS

The experiment was conducted during 2023 in the Department of Dairy Technology, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology & Sciences (SHUATS), Prayagraj (U.P). The experiment entitled “Development of RTS from a blend of Orange, Aloevera, and Mint “ adapted Randomized block Design consisting of 4 treatments and five replications. Orange, Aloe vera and Mint were randomly selected and purchased from fruit and vegetable mandi in Prayagraj (U.P), India. Other ingredients like sugar were brought from local shops in Prayagraj. Other items like glass bottles (200 ml) bought online at Indiamart website.

Fresh and superior quality oranges were washed, peeled off, cut into halves, seeds were removed and extraction was done by Manual hand squeezing. The juice was filtered using muslin cloth to remove unwanted particles stored at refrigerated temperature until use. Fresh aloe vera leaves were collected and washed with tap water. Gel was separated by cutting leaves vertically and blended in a juice blender to make a smooth and homogenized mixture. Mint leaves juice were extracted with the help of a laboratory blender followed by filtering through muslin cloth.

Formulation of RTS

The Orange based RTS blended with Aloe Vera, and mint juice was prepared as per the flow chart. The RTS was prepared in three different variations coded as T1 (Orange:Aloe vera: Mint ; 97 : 1 : 2), T2 (Orange : Aloe-vera : Mint: 94.5 : 1.5 : 4), T3 (Orange: Aloe vera :Mint : 92 : 2 : 6).

RTS prepared only from Orange juice was kept in control. The calculated amount of sugar and citric acid was added and 0.3 % acidity. KMS @ 100 ppm was added and pasteurized at 72! and kept at ambient temperature.

RESULTS

The results revealed that physico-chemical characteristics of Blended Beverages (RTS) Prepared from Orange, aloe vera and mint had the following performance.

pH

The maximum pH (4.85) was observed in T₁ orange (97%) + aloe vera (1%) + mint (2%). Whereas the minimum pH (4.78) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%).

Total Solids

The maximum Total Solids (16.7) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum Total Solids (15.8) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Fat

The maximum Fat (0.21) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum Fat (0.18) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Protein

The maximum Protein (0.73) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum Protein (0.67) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Carbohydrates

The maximum Carbohydrate (14.15) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum Carbohydrate (13.21) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Ash

The maximum Ash (0.50) was observed in T₃ orange (92) + aloe vera (2) + mint (6). Whereas the minimum Ash (0.43) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%).

Acidity

The maximum Acidity (1.03) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum acidity (0.73) was observed in T₂ orange (94.5%) + aloe vera (1.5%) + mint (4%).

Ascorbic acid

The maximum Ascorbic acid (12.44) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum ascorbic acid (11.44) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Calcium

The maximum calcium (11.77) was observed in T₃ orange (92) + aloe vera (2) + mint (6). Whereas the minimum calcium (10.76) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%).

Potassium

The maximum potassium (201) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%).

Whereas the minimum potassium (181) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Table 1. Table showing average data of different parameters of RTS beverage

Physico-Chemical Parameters	Treatments			
	T ₀	T ₁	T ₂	T ₃
pH	4.78	4.85	4.82	4.83
Total Solids%	16.7	16.4	16.2	15.8
Fat%	0.21	0.20	0.19	0.18
Protein%	0.73	0.71	0.69	0.67
Carbohydrate%	14.15	13.82	13.44	13.21
Ash%	0.43	0.45	0.48	0.50
Acidity	1.03	0.95	0.73	0.82
Ascorbic acid (mg)/100g	12.44	12.01	11.76	11.44
Minerals				
Calcium (mg)/100g	10.76	11.08	11.45	11.77
Potassium (mg)/100g	201	194	187	181
Sensory Attributes				
Colour and Appearance	7.82	8.74	8.30	8.00
Taste and Flavour	8.2	8.4	7.7	7.2
Consistency	7.76	8.76	8.46	8.04

T₀- drink prepared by 100% of orange.

T₁- drink prepared by 97% of orange, 1% of aloe vera, 2% of Mint

T₂- drink prepared by 94.5% of orange, 1.5% of aloe vera, 4% of Mint

T₃- drink prepared by 92% of orange, 2% of aloe vera, 6% of Mint

Colour and Appearance Score

The maximum Colour and Appearance Score (8.74) was observed in T₁ orange (97%) + aloe vera (1%) + mint (2%). Whereas the minimum Colour and Appearance Score (7.82) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%).

Taste and Flavour

The maximum Taste and flavour (8.40) was observed in T₁ orange (97%) + aloe vera (1%) + mint (2%). Whereas the minimum Taste and flavour (7.20) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

Consistency

The maximum consistency (8.76) was observed in T₁ orange (97%) + aloe vera (1%) + mint (2%). Whereas the minimum consistency (7.76) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%).

Cost analysis

The maximum cost analysis (Rs.30) was observed in T₀ orange (100%) + aloe vera (0%) + mint (0%). Whereas the minimum cost analysis (Rs.24.8) was observed in T₃ orange (92) + aloe vera (2) + mint (6).

CONCLUSION

Based on findings of the present experiment it is concluded that T₁ orange (97%) + aloe vera (1%) + mint (2%) was found superior in respect of the physico chemical parameters like Total Solids, Acidity, pH, Fat(%), Protein(%), Carbohydrate(%), Ash(%) and Ascorbic Acid. With respective sensory attributes like Colour and appearance, Aroma, Flavor and taste and Overall acceptability also T₁ orange (97%) + aloe vera (1%) + mint (2%) was found as best.

REFERENCES

- Kausar, T., Shamim, F., Gorski, F.I. and Ainee, A. 2020. Preparation and quality evaluation of ready to serve beverage (RTS) from orange juice and Aloe vera gel during storage. *Pure and Applied Biol.* 9 (1) : 219-228.
- Raghavan, S. 2006. Handbook of spices, seasonings, and flavorings. CRC Press Taylor & Francis Group.
- Straumite, E., Kruma, Z. and Galoburda, R. 2015. Pigments in mint leaves and stems. *Agronomy Research.* 13(4): 1104–1111.