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Standardization and sensory evaluation of RTS developed from blends of Watermelon, Aloe Vera and Ginger Juice

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Abstract

A research experiment entitled “Standardization and Sensory Evaluation of RTS Developed from blends of Watermelon, Aloe Vera and Ginger Juice” was conducted at the laboratory of Vegetable Science Department, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the year 2019-2020. The Ready-to-Serve made by blending watermelon, aloe vera and ginger pure juices is full of nutraceutical values. Seven treatments combinations (T₁ to T₇) having different concentrations of watermelon, aloe vera and ginger juice was prepared and sensory evaluation was done on the basis of 9 point hedonic scale rating test to standardize the recipe. The study revealed that, treatment T₇ of the blended RTS beverage having the combination of 80 per cent watermelon juice, 15 per cent aloe vera juice and 5 per cent ginger juice was the best combination of blending as it scored highest value (7.7) for overall acceptability. The developed blended RTS which is loaded with several health benefits has a huge scope for large scale production at industrial level.

Keywords: Nutraceutical, ready-to-serve, sensory evaluation

Introduction

Watermelon (*Citrullus lanatus* Thunb.) belongs to the family cucurbitaceae is indigenous to Tropical Africa. Watermelon has elevated level of economic as well as nutritional importance. Watermelon fruit contains Protein (0.6g/100g flesh), Dietary fibre (0.4g/100g), Total fat (0.15g/100g), Niacin (0.178mg/100g), Pantothenic acid (0.221mg/100g), Vitamin A (569mg/100g), Vitamin C (8.1mg/100g), Potassium (112mg/100g), Iron (0.24mg/100g), Manganese (0.038mg/100g), Zinc (0.10mg/100g) and phytonutrients like Carotene-alpha (303µg/100g), Lycopene (4532µg/100g) (Verma *et al.*, 2017) [7]. It is additionally considered as a rich wellspring of lycopene and citrulline. It is useful for heart wellbeing as it contains potassium which helps in controlling pulse and circulatory strain, in this way diminishes odds of stroke and coronary illness (Jian *et al.*, 2005) [2].

Aloe Vera (*Aloe barbadensis* Mill.) is a stem less and succulent plant of Liliaceae family. Aloe vera has consistently been utilized for its therapeutic properties. Aloe vera is comprised of various compounds like vitamins, enzymes, saponins, amino acids and minerals (Sawai, 2014) [6]. Aloe vera gel and juice is generally used to treat skin burn, itch relief, juice reduces cholesterol, digestive disorders like ulcers, heart burn and constipation.

Ginger (*Zingiber officinale* Rosc.) is a perennial herb. It is a very popular and important ingredient used in cooking in India as well as throughout the world. Ginger is a very potent antioxidant and has diverse medicinal use. Fresh whole ginger is used for pickling and making candies, fresh ginger juice is used for preparing various beverages whereas, dry ginger can be utilized for making ginger powder, oleoresin, essence, soft drink, non-alcoholic ginger beverages and ginger oil. The medicinal property of ginger has the ability to treat rheumatoid arthritis, ulcer, preventing heart attack and stroke. Ginger is also used as anti-viral, anti-cancer, and anti-ulcerogenic drug (Denyer *et al.*, 1994; Katiyar *et al.*, 1996; Johji *et al.*, 1988) [1, 4, 3].

Processing is an outstanding way for the consumption of seasonal surplus of vegetables and fruits. Value addition prevents great spoilage of perishable vegetables and fruits. Consumers are always interested in new products which are full of nutrition as well as having pleasant taste. RTS is picking up prevalence because of their astounding taste and nutritive qualities.

Keeping all the above facts in mind this blended RTS beverage has been prepared to reduce the unpalatable taste of the ingredients and to deliver excellent therapeutic benefits to consumers. This research work is undertaken to standardize a recipe for RTS developed from blend of watermelon, aloe vera and ginger and to test the sensory qualities of the prepared RTS.

The present investigation entitled "Standardization and

Sensory Evaluation of RTS Developed from blends of Watermelon, Aloe Vera and Ginger Juice" was carried out in the laboratory of Vegetable Science Department, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). In this research work different treatments having different concentrations of watermelon, aloe vera and ginger juice were prepared. All the treatment combinations were analysed for sensory evaluation.

Table 1: Treatment Combinations

Treatment	% Watermelon Juice	% Aloe Vera Juice	% Ginger Juice
T1	20	45	35
T2	30	40	30
T3	40	35	25
T4	50	30	20
T5	60	25	15
T6	70	20	10
T7	80	15	5

Materials and Method

Watermelon and ginger was bought from local market while aloe vera was collected from IGKV campus. Other raw materials used was sugar, citric acid, sodium benzoate, raspberry red food colour, juice bottles procured from local market.

Extraction of Watermelon Juice

The sound, mature and fresh watermelon was selected for extraction of juice. Watermelons first need to be washed under running tap water to clean the surface if adhered with dust and dirt. Then the watermelon was cut into slices using sharp knife. The cut slices containing seeds; peel along with white portion was removed. Then the slices were cut into pieces. These pieces were then transferred to mixer- grinder pot for making the pulp. Then the juice was strained from the pulp using clean muslin cloth. Pure watermelon juice was recovered from the pulp.

Extraction of Aloe Vera Juice

The aloe vera pulp was taken out by the traditional hand filleting method to avoid the contamination of internal fillet with the yellow sap. The fresh, succulent, undamaged, mature (3-4years), rot free leaves were taken for preparing the juice. The lower 1 inch of the leaf base (the white part attached to the large roset stem of the plant), the tapering point of 2-4 inches of leaf top and the short, sharp spines along the leaf margins were removed by using a sharp knife. Then the upper peel of the leaf was removed by introducing knife in the mucilage layer below green rind. Similarly the bottom peel was removed. The highest concentration of potentially beneficial aloe constituents are found in mucilage. The filleting is done within 36hours of harvesting the leaves.

The then pulp was heated at 60-65 °C for 10 minutes. Then the heated pulp is grinded in mixer-grinder. The mashed pulp was then strained using clean muslin cloth to get pure aloe vera juice.

Extraction of Ginger Juice

Fresh, clean, big and healthy rhizomes of ginger were selected. The rhizomes were first washed in clean water to remove the mud adhered in rhizome. The rhizomes were then peeled and cut into pieces. These pieces were then churned using grinder to make pulp. The pulp was then strained with muslin cloth to obtain pure ginger juice.

Preparation of RTS

After obtaining pure watermelon, aloe vera and ginger juice the RTS was prepared by blending all three juices in different concentrations as per the treatments and homogenization was done for all the treatment RTS. Sugar was added according to TSS (10%). Then citric acid @3.5g/1.5lt of RTS and sodium benzoate @1.5g/1.5lt of RTS was added as a preservative. The bottling was done in 250ml juice bottle each and crown corked. All the prepared treatments were then stored in the laboratory at room temperature.

Sensory Analysis

This is a test which measures the consumer's acceptability for the product. In this method, a semi-trained panel consisting of several judges, belonging to different age groups and having different eating habits was constituted to evaluate the sensory qualities of the product. The sensory qualities were evaluated using 9 point hedonic rating test method as suggested by Ranganna (2001) [5].

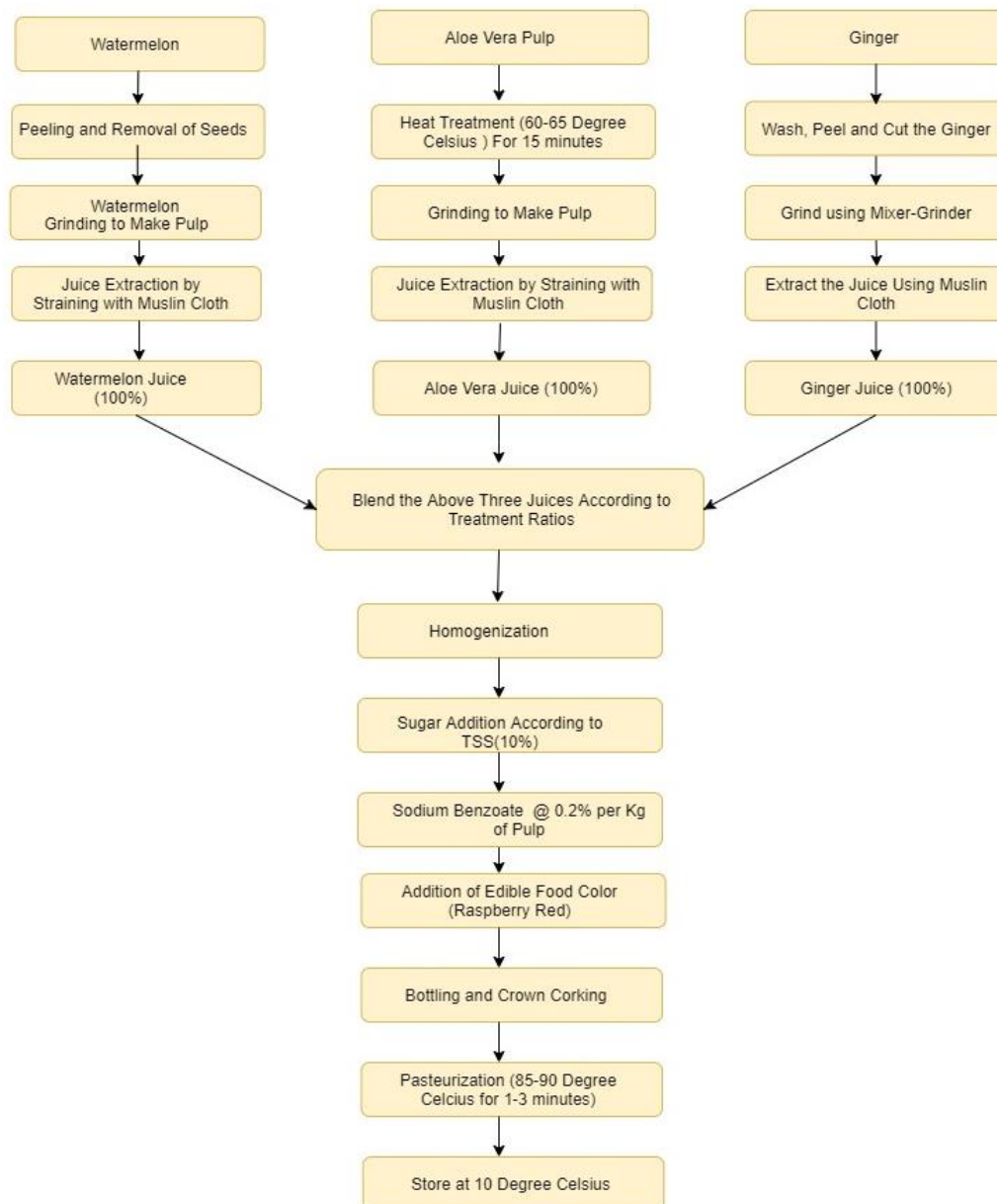


Fig 1: Flowchart of Preparation of RTS

Result and Discussion

Standardization of RTS

The preliminary trials were conducted to assess the optimum level of ingredients for the blended RTS beverage. The optimum levels of all the ingredients *viz.*, juice, sugar, citric acid, sodium benzoate, food colour and water were selected. The better combination levels of juice 10 per cent, sugar according to 10 per cent TSS, citric acid 3.5g and water 900ml for 1000ml RTS beverage were standardized.

Sensory Evaluation

The data regarding sensory evaluation of fresh blended RTS

beverage are presented in Table 2. Seven samples of blended RTS was prepared by combining watermelon, aloe vera and ginger juice in different concentrations and are presented to a group of panellist for sensory evaluation. The result was obtained on a 9 point hedonic scale where 9 indicated like extremely, 8- like very much, 7- like moderately, 6- like slightly, 5- neither like nor dislike, 4- dislike slightly, 3- dislike moderately, 2- dislike very much and 1- dislike extremely. According to the results of hedonic rating test, T₇ was the best blending combination and most acceptable in terms of its sensory attributes. T₇ is comprised of 80 percent watermelon juice, 15 per cent aloe vera juice and 5 per cent ginger juice.

Table 2: Sensory Evaluation of the Fresh Blended RTS

Treatments	Colour and Appearance	Flavour	Taste	Overall Acceptability	Rating
T1	5.8	7.0	5.2	6.0	Like Slightly
T2	5.8	6.3	6.1	6.1	Like Slightly
T3	6.3	5.7	6.5	6.2	Like Slightly
T4	6.1	5.5	7.4	6.3	Like Slightly
T5	7.8	7.1	7.4	7.4	Like Moderately
T6	8.2	7.3	7.1	7.5	Like Moderately
T7	8.5	7.6	7.2	7.7	Like Very Much

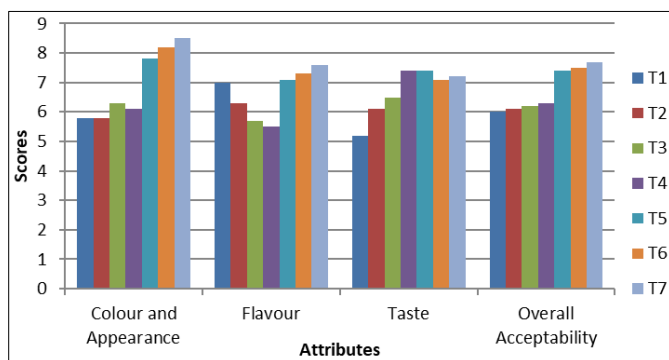


Fig 2: Sensory evaluation of different treatments of Blended RTS

Conclusion

The purpose of preparing this blended RTS beverage is to enhance the nutritional quality of the product which can be consumed by any age group. Blending such medicinally rich juices can be a good source for those who suffer from stomach related problems and some other ailments. After evaluating all the sensory attributes *viz.* Colour and appearance, flavour, taste and overall acceptability, it can be concluded that T₇ (80 per cent watermelon juice, 15 per cent aloe vera juice, 5 per cent ginger juice) found to be the best treatment among all as it obtained the highest organoleptic score and was liked very much and found to be the most acceptable combination for blending.

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