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## Development and quality assessment of health beverage from apple juice blended with carrot and ginger

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### Abstract

In order for a country to be healthy, strong, and productive during the COVID-19 pandemic, the nutritional status of its people must be good. In the new millennium, we are replacing the upward trend in nutritional and health awareness that has increased the consumer demand for healthy drinks with immunity boosting properties. The goal of the current experiment was to create a health beverage using apple juice and the inclusion of carrot and ginger juice. Treatment T1 had an apple juice standard of 85% and carrot standard of 15%, T2 had an apple juice standard of 75% and carrot standard of 25%, and T3 had an apple juice standard of 65% and carrot standard of 35%, and 2.5% of ginger juice added as standard in treatments. The product's organoleptic characteristics, such as flavour and taste, colour and appearance, and consistency, were evaluated by trained panellists using a 9-point hedonic scale, in addition to physico-chemical analysis for estimating its nutritional content and microbial analysis such as SPC (standard plate count) and coliform count for product safety. The treatments scoring the highest value is T1 with 85% apple juice, 15% carrot juice and 2.5% ginger juice. Thus, based on physico-chemical, microbial and organoleptic evaluation the treatment can be rated as T1>T0>T2>T3.

**Keywords:** Healthy, immunity boosting properties, health beverage, organoleptic, physico – chemical analysis

### Introduction

In many nations around the world, fruit juice is a popular beverage. In hot climates, cafes, restaurants, and roadside stands have the ability to squeeze the juice from fresh fruits, which is then served to thirsty patrons heavily doused in ice. Fruit juices produced under sanitary circumstances may contribute significantly to improving consumer health by preventing illnesses including breast cancer, congestive heart failure (CHF), and urinary tract infections.

Fruits and vegetables naturally contain juice, which is a liquid. Additionally, it can be used to describe beverages that use these or other biological food components, including meat and seafood, as flavourings. It is frequently drunk as a beverage and utilised as a cooking component or seasoning. Fruit juice is a widely used beverage in many countries all over the world. Cafes, restaurants, and roadside shops can squeeze the juice from fresh fruits in hot regions, and then serve it to thirsty customers strongly iced. By preventing conditions like breast cancer, congestive heart failure (CHF), and urinary tract infections, fruit juices made under hygienic conditions may considerably improve consumer health.

Juice, a liquid, is a naturally occurring component of fruits and vegetables. Additionally, it can be used to describe alcoholic beverages that flavour themselves with these or other biological food ingredients, such as meat and seafood. It is commonly used as a spice or cooking ingredient as well as a beverage. In contrast to fruit-based drinks, which contain vitamins (A, B, C, and K, among others) and minerals (iron, calcium, and potassium, among others), synthetic beverages only contain water (about 88%) and total carbohydrate (about 12%) and give about 48kcal. Fruit beverages are thus replacing fruit-based drinks since they are considerably superior to many synthetic preparations.

Apple juice contains a number of nutrients and minerals, including boron, which may support strong bones. Apple juice consumption raises the brain's acetylcholine levels, which could lead to better memory. Potassium, vitamin C, and antioxidants are abundant in apples.

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Due to its numerous health advantages, carrot juice is commonly referred to as "wonder juice." Carrot juice has been discovered to significantly enhance the health of many people from all walks of life who suffer from a variety of ailments. Numerous people have discovered it to be an effective "protective" agent in the development and maintenance of health in both children and adults. Its delectable flavour also makes it a favourite among the entire family as a beverage, whether consumed alone or blended with other juices. While freshly blended carrot juice is readily available, packaged carrot juices are infrequently found in local as well as store. Drinking carrot juice may prevent cardiovascular disease by improving overall antioxidant status and lowering lipid peroxidation, both of which effects are independent of cardiovascular risk.

Asthma, diabetes, menstruation irregularities, arthritis, stomach distress, and others have all been treated using ginger as a part of healing regimens. According to scientific research, ginger's antioxidant capabilities may help with nausea and vomiting caused by pregnancy, surgery, cancer treatment, or motion sickness. There is also some evidence that ginger may lessen pain and inflammation.

Juice made from apple, carrot, and ginger will be incredibly nutritious, pleasant, and refreshing while also providing the body with the vitamins, minerals, antioxidants, and vital flavonoids it needs.

It can be concluded that regular fruit juice can be successfully prepared by using carrot juice and ginger juice with sensory characteristics at par to that of premium apple juice. Such fruit juice was sensorial more acceptable than regular fruit juice made commercially available stabilizer and preservatives.

**Material and Method**

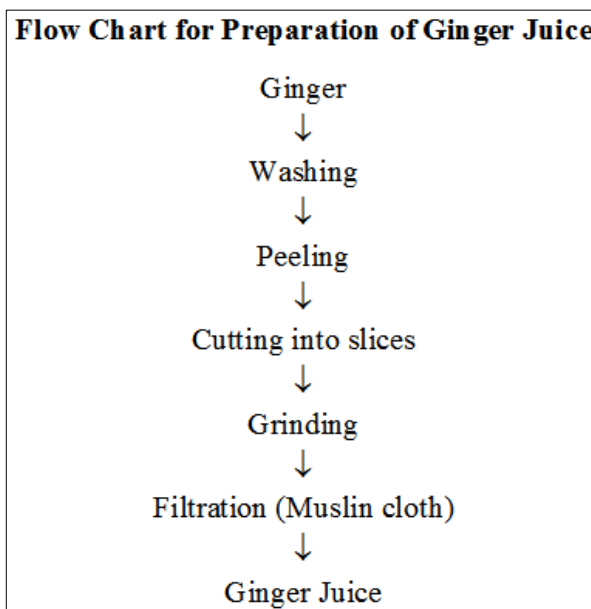
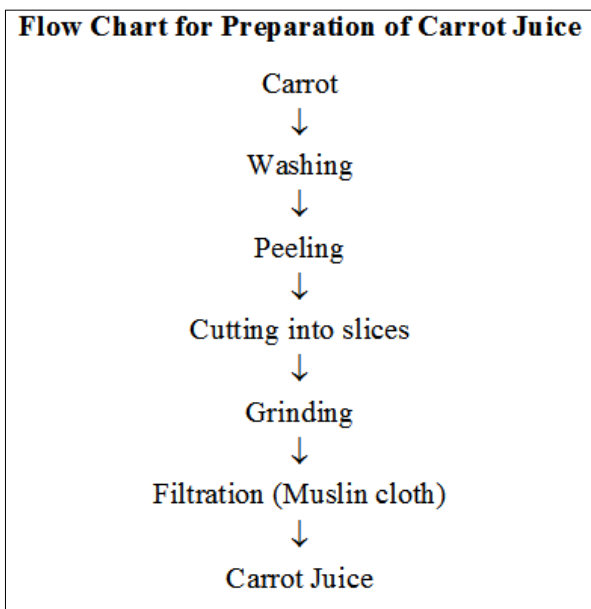
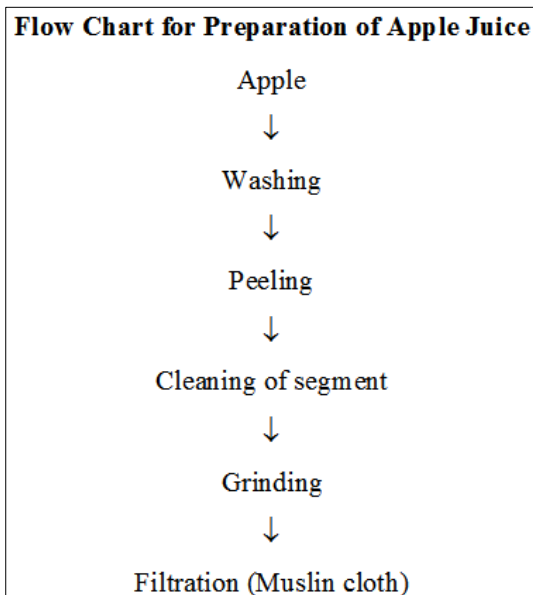
The Experiment "Preparation of health Beverage from apple

juice from blended with carrot and ginger" was carried out in a research lab, Warner College of Dairy Technology, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Prayagraj, U.P, India.

**Materials**

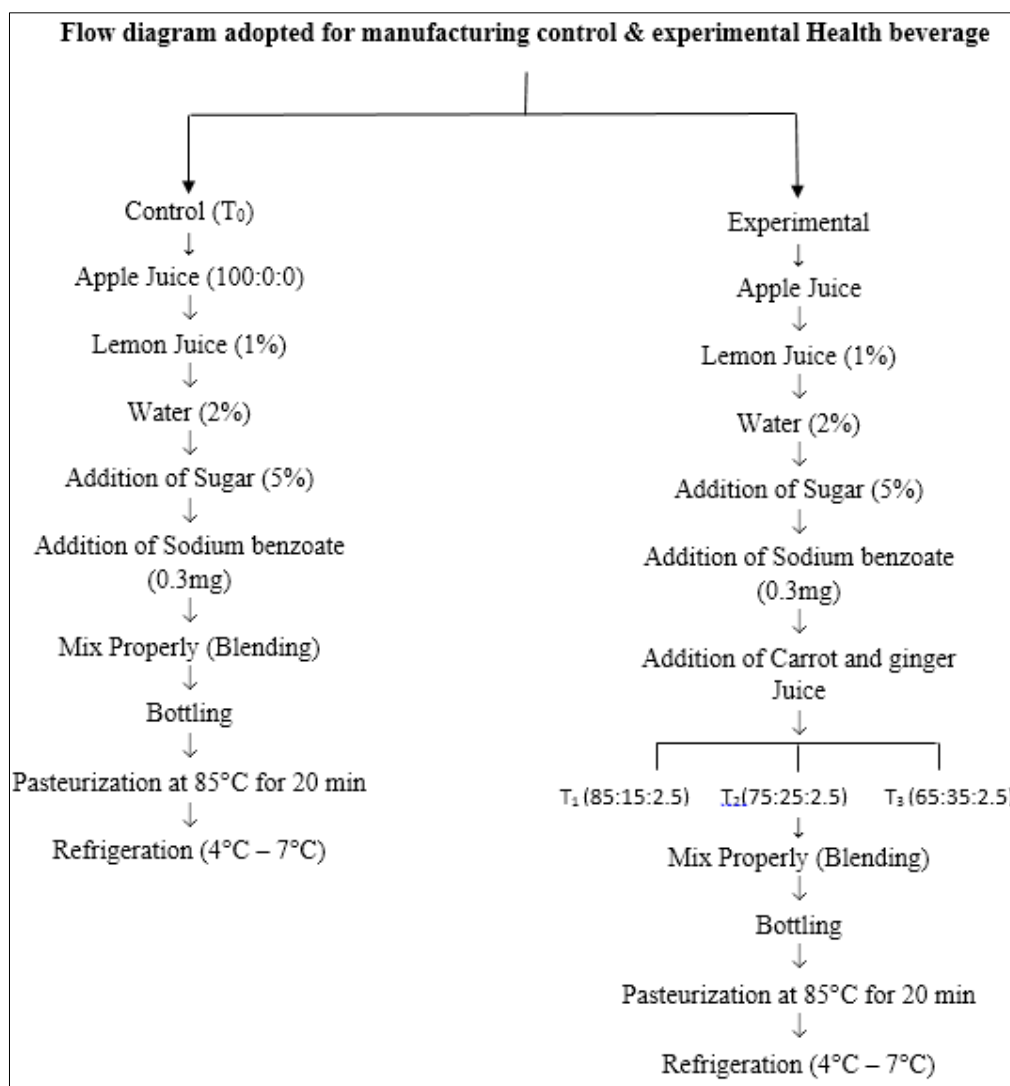
Procurement and collection of ingredients

- Fresh and mature apple, carrot, ginger and lemon was purchased from local market of Prayagraj.
- Good quality sugar was purchased from local market of Prayagraj.
- Other material like sodium benzoate and mineral water was also collected from local market.



**Table 1:** Treatment Table

	Apple Juice	Carrot Juice	Ginger juice
T <sub>0</sub>	100	00	00
T <sub>1</sub>	85	15	2.5
T <sub>2</sub>	75	25	2.5
T <sub>3</sub>	65	35	2.5



**Average of data obtain on different parameter of health beverage from apple juice blended with carrot and ginger**

**Table 2:** The different parameter of control and experimental health beverage

Parameter	Treatments				C.D. Value
	T0	T1	T2	T3	
<b>1. Chemical Analysis</b>					
pH	4.75	4.91	4.94	4.98	0.061
TSS (°Brix)	15.4	14.6	13.7	13.4	0.247
Titrateable Acidity %	0.69	0.60	0.56	0.51	0.043
Ascorbic Acid %	2.61	3.53	3.83	4.14	0.036
Total solids %	13.92	14.21	14.22	14.15	0.081
Ash %	0.41	0.45	0.49	0.50	0.023
Carbohydrate %	16.19	15.94	15.82	15.64	0.055
<b>2. Organoleptic Scores (9 Point Hedonic Scale)</b>					
Color & Appearance	8.5	8.5	8.0	7.7	0.268
Consistency	7.8	8.3	7.8	7.4	0.200
Flavor & Taste	7.6	8.1	7.5	7.1	0.530
Overall Acceptability	7.9	8.3	7.8	7.4	0.299
<b>3. Microbial Analysis</b>					
SPC (x10 <sup>3</sup> cfu/ml)	4.2	4.6	5.2	5.8	0.881
Coliform	NIL	NIL	NIL	NIL	NIL
<b>4. Cost Analysis</b>					
Cost per liter juice (Rs.)	127.1	124.6	119.6	114.6	NA

**Result and Discussion**

**Chemical Parameters of Health Beverage**

**pH**

The highest mean of pH was recorded in the health beverage

prepared with different levels of apple, carrot and ginger juice sample of T<sub>3</sub> (5.24), followed by T<sub>2</sub> (5.20), T<sub>1</sub> (5.15) and T<sub>0</sub> (4.98). The difference in these values of pH T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, T<sub>0</sub> – T<sub>3</sub> & T<sub>1</sub> – T<sub>3</sub> were significant.

**Total Soluble Solids**

The highest mean of TSS was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>0</sub> (15.44), followed by T<sub>1</sub> (14.6), T<sub>2</sub> (13.68) and T<sub>3</sub> (13.44). The difference in these values of TSS T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, T<sub>0</sub> – T<sub>3</sub>, T<sub>1</sub> – T<sub>2</sub> & T<sub>1</sub> – T<sub>3</sub> were significant.

**Ascorbic Acid**

The highest mean of ascorbic acid was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>0</sub> (2.69), followed by T<sub>1</sub> (2.18), T<sub>2</sub> (2.04) and T<sub>3</sub> (1.60). The difference in these values of ascorbic acid T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, T<sub>0</sub> – T<sub>3</sub>, T<sub>1</sub> – T<sub>2</sub>, T<sub>1</sub> – T<sub>3</sub> & T<sub>2</sub> – T<sub>3</sub> were significant.

**Titratable Acidity**

The highest mean of titratable acidity was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>0</sub> (0.692), followed by T<sub>1</sub> (0.598), T<sub>2</sub> (0.558) and T<sub>3</sub> (0.512). The difference in these values of acidity T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, T<sub>0</sub> – T<sub>3</sub>, T<sub>1</sub> – T<sub>2</sub>, T<sub>1</sub> – T<sub>3</sub> & T<sub>2</sub> – T<sub>3</sub> were significant.

**Ash**

The highest mean of ash content was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>3</sub> (0.50), followed by T<sub>2</sub> (0.49), T<sub>1</sub> (0.45) and T<sub>0</sub> (0.41). The difference in these values of ash T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, T<sub>0</sub> – T<sub>3</sub>, T<sub>1</sub> – T<sub>2</sub>, T<sub>1</sub> – T<sub>3</sub> & T<sub>2</sub> – T<sub>3</sub> were significant.

**Carbohydrates**

The highest mean of carbohydrate was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>1</sub> (13.50), followed by T<sub>0</sub> (13.49), T<sub>2</sub> (13.39) and T<sub>3</sub> (13.24). The difference in these values of carbohydrate T<sub>0</sub> – T<sub>1</sub>, T<sub>0</sub> – T<sub>2</sub>, T<sub>0</sub> – T<sub>3</sub>, T<sub>1</sub> – T<sub>2</sub>, T<sub>1</sub> – T<sub>3</sub> & T<sub>2</sub> – T<sub>3</sub> were significant.

**Organoleptic Parameter of health beverage****Color and appearance**

The highest mean of color and appearance was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>0</sub> (8.46), followed by T<sub>1</sub> (8.46), T<sub>2</sub> (8.0) and T<sub>3</sub> (7.66).

**Consistency**

The highest mean of consistency was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>1</sub> (8.34), followed by T<sub>2</sub> (7.82), T<sub>0</sub> (7.76) and T<sub>3</sub> (7.42).

**Flavor & taste**

The highest mean of flavor and taste was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>1</sub> (8.1), followed by T<sub>0</sub> (7.56), T<sub>2</sub> (7.54) and T<sub>3</sub> (7.06).

**Overall Acceptability**

The highest mean of overall acceptability was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>1</sub> (8.3), followed by T<sub>0</sub> (7.94), T<sub>2</sub> (7.76) and T<sub>3</sub> (7.4).

**Microbiological analysis of health beverage****Standard Plate Count**

The highest mean of standard plate count was recorded in the health beverage prepared with different levels of apple, carrot and ginger juice sample of T<sub>3</sub> (5.8), followed by T<sub>2</sub> (5.2), T<sub>1</sub> (4.6) and T<sub>0</sub> (4.2). The difference in these values of standard plate count T<sub>0</sub>-T<sub>1</sub>, T<sub>0</sub>-T<sub>2</sub>, T<sub>0</sub>-T<sub>3</sub> & T<sub>1</sub>-T<sub>3</sub> were significant.

**Coli form**

None of the samples of health beverage samples showed the presence of coli form, which indicates that proper hygiene conditions were maintained during the preparation and storage of the product.

**Conclusion**

In view of the experimental results obtained during the present investigation, it may be concluded that the apple juice blended with carrot and ginger juice can be satisfactorily added together for making health beverage. Health beverage made with Apple, carrot and ginger juice of treatment T<sub>1</sub> (85:15:2.5) were best in organoleptic characteristics and received highest score in color & appearance, consistency, Flavor & taste and overall acceptability as 8.5, 8.3, 8.1 and 8.3 respectively by the panel of judges in the evaluation. T<sub>1</sub> (85:15:2.5) was best in microbial characteristics with minimum SPC as 6.2 x 10<sup>3</sup> cfu/mL; and negative in coli form test thereby indicating maintenance of good hygiene. Sample of treatment T<sub>3</sub> (65:35:2.5) is best the cost of preparation of health beverage prepared from apple juice blended with carrot and ginger juice in treatment T<sub>3</sub> (65:35:2.5) was found to be least price of Rs. 114.6 per Litre of juice.

**References**

1. Aley Bayındırlı, Hami Alpas, Faruk Bozoglu, Mirzahan Hizal. Efficiency of high-pressure treatment on inactivation of pathogenic microorganisms and enzymes in apple, orange, apricot and sour cherry juices., Food Control. 2004;(17):52-58.
2. Ali SA. Handbook Fruit juice processing, 2008.
3. Ana Sant, Anderson de Souza, Rosenthal Amauri, de Massaguer Pilar Rodriguez. The fate of patulin in apple juice processing: A review. Food Research International. 2008;(41):441-453.
4. Dr. Baghurst Katrine. The Health Benefits of Citrus Fruits CSIRO Health Sciences & Nutrition Project Number: CT02057, 2003.
5. Bhagwan D, Awedhesh K. Development and storage of mango ginger RTS beverage. International Journal of Food, Agriculture and Veterinary Sciences. 2014;4(3):15-20.
6. Bhardwaj RL, Mukherjee S. Effects of fruit juice blending ratios on kinnow juice preservation at ambient storage condition. African Journal of Food Science, 2011;5(5):281-286.
7. Biswas S, Chowdhury AR. Development of Ready to Serve Beverage with the inclusion of Herbal Components. International Journal of Latest Trends in Engineering and Technology. 2017;8(4):147-154.
8. Caminiti AS, Ronald EW, David AH. Influence of processing and storage on the phenolic composition of Apple Juice. J Agric. Food Chem., 2010-1990;38(7):1572-1579
9. Changyu. Study on blended beverage. Journal of Food

- Science and Technology. 2002;26:310.
10. Chauhan D, Puranik V, Rai K. Development of functional herbal RTS beverages. Open Access Scientific Reports. 2012;1(12):25-31.
  11. Dugan David D. The importance of fruit and vegetable juice in nutrition, 2000.
  12. Eriq K. Stable clear blended carrot-orange juice beverage production using enzyme and cyclodextrin, 2011;2:466.
  13. FSSAI. Food Safety and Standards Authority of India, 2006.
  14. Haq R, Prasad K. Nutritional and processing aspects of carrot (*Daucus carota*) - A review. South Asian J. Food Technol. Environ. 2015;1(1):1-14.
  15. Morgan DJ. Shelf life and sensory evaluation of orange juice after exposure to thermo sonication and pulsed electric fields. 87(2):102-107.
  16. Noci F, Riener J, Ribeiro MM, Cronin DA, Morgan DJ, Lyng JG. Ultraviolet irradiation and pulsed electric fields (PEF) in a hurdle strategy for the preservation of fresh apple juice. Journal of Food Engineering. 2008;85:141-146.
  17. Panday J, Singh SS, Nath N. Preparation of health beverage from sweet orange juice blended with Aloevera. The Pharma Innovation. 2017;6(6, Part B):98.
  18. Sogy DS, Singh. Studies on bitterness development in fruit juice Ready-To-Serve beverage. Squash. Jam and Candy. J Food Sci. Technol. 2001;38(5):433-438.