



RESEARCH ARTICLE

STUDIES ON BLENDING OF TOMATO AND ORANGE JUICE FOR PREPARATION OF SQUASH

¹Sivakumar, K.P., ²Nallakurumban, B. and ³Balaji, T.

¹Assistant Professor, Dept., of FRM and CS, Community Science College and Res. Instt., Tamil Nadu Agricultural University (TNAU), Madurai-625 104; ²Associate Professor, Krishi Vigyan Kendra, Tamil Nadu Agricultural University, Aruppukottai, Virudunagar District; ³Assistant Professor, Krishi Vigyan Kendra, Tamil Nadu Agricultural University (TNAU), Ramnad

ARTICLE INFO

Article History:

Received 20th September, 2023
Received in revised form
27th October, 2023
Accepted 15th November, 2023
Published online 20th December, 2023

Key words:

Tomato, Orange, Squash, Chemical Analysis, Storage and Sensory Qualities.

*Corresponding author:

Esmail Alrajhi

Copyright©2023, Sivakumar et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Sivakumar, K.P., Nallakurumban, B. and Balaji, T. 2023. "Studies on blending of tomato and orange juice for preparation of squash". *International Journal of Current Research*, 15, (12), 26663-26664.

ABSTRACT

Obesity is a major public health crisis both globally and within Saudi Arabia. The increasing prevalence across nations carries severe consequences for population health and healthcare systems. Obesity elevates the risks for numerous chronic diseases like heart disease, stroke, type 2 diabetes, cancer and osteoarthritis, resulting in reduced quality of life and expectancy. The economic costs are equally staggering, estimated over \$2 trillion annually including both direct medical costs and indirect productivity losses. Within Saudi Arabia, rapid urbanization, economic growth and associated lifestyle changes have catalyzed the obesity epidemic. The public health implications are just as severe as the global situation. Saudi Arabia faces one of the highest obesity rates worldwide, with around 30% of adults classified as overweight or obese. This has contributed to soaring rates of related chronic illnesses and risks within the Saudi population (Althumiri *et al.*, 2021).

INTRODUCTION

Tomato (*Lycopersicon esculentum*) being used in cooked vegetables, soups and salads has occupied an important place in our dietary pattern. It can be processed into various products like juice, paste, puree, concentrate, ketchup and dry powder. Moreover, with the availability of high yielding hybrids latterly, the cultivation of tomatoes has become highly remunerative for the vegetable growers. Consequently, tomato stands second in the country in its production, but first as far as processing is concerned (Madaiah *et al.*, 1986). Fruit juices and fruit juice beverages are becoming popular due to their pleasing flavour nutritional characteristics. Value added products like jams, jellies, squashes, sauces and wine were also prepared from specific fruits, individually or in combination with other fruits commercially to suit the palate of the consumer and the same were also marketed (Swatiyamdagni, 1995). In the present investigation an attempt has been made by blending the tomato and orange juice in different combination to produce an acceptable quality of squash and to determine their storage stability.

MATERIALS AND METHODS

Tomato and orange of proper maturity and ripeness were purchased from the local market and washed thoroughly in running water before processing.

Preparation of tomato juice: Tomato was cut into small pieces, crushed manually and the juice was extracted. The juice was then filtered through a muslin cloth.

Preparation of orange juice: After washing, sorting and cut into two halves. Orange segments pieces were crushed on juice extractor and then filtered through a muslin cloth.

Standardization of blending of tomato and orange juice for preparation of squash: The preliminary trials were conducted on tomato juice for standardization of squash using different level of orange juice. The taste and acceptability were changed with the increase in orange juice level upto 50 per cent and further decreased. This decrease might be due to increased astringency of orange juice. The orange juice was then standardized upto 30 per cent was suitable (Tomato and Orange juice in the proportion of 90:10, 80:20 and 70:30). The preparation of squash as per FPO specification. The prepared beverages were filled in sterilized bottles, capped air tightly and stored at room temperature.

CHEMICAL ANALYSIS: The chemical analysis was done in monthly once during storage period. the total soluble solids (TSS) was determined by using Erma hand refractometer and the acidity was determined by titrating against standard sodium hydroxide solution using phenolphthalein as an indicator and expressed as an hydrous citric acid (Ranganna, 1995).

Table 1. Chemical changes of tomato and orange juice blended squash during storage

Percentage of blends	Storage period (in months)	TSS (°Brix)	Acidity (%)	pH	Reducing sugar (g %)	Total sugar (g %)	Ascorbic acid (mg %)
10%	0	45	1.02	4.55	16.46	35.58	51.35
	1	45	1.02	4.55	16.49	35.44	51.27
	2	45	1.12	4.53	16.54	35.28	51.15
	3	45	1.34	4.50	16.56	35.13	51.04
	4	45	1.48	4.46	16.60	35.02	50.86
	5	45	1.60	4.43	16.66	34.90	50.63
	6	45	1.81	4.38	16.72	34.79	50.42
20%	0	46	1.00	4.58	16.49	35.61	49.17
	1	46	1.00	4.57	16.49	35.53	49.09
	2	46	1.08	4.55	16.51	35.41	49.00
	3	46	1.23	4.52	16.53	35.34	48.89
	4	46	1.37	4.48	16.53	35.22	48.74
	5	46	1.44	4.46	16.56	35.10	48.62
	6	46	1.58	4.46	16.59	34.99	48.49
30%	0	46	1.01	4.63	16.54	35.65	47.76
	1	46	1.09	4.61	16.57	35.58	47.63
	2	46	1.22	4.60	16.60	35.46	47.40
	3	46	1.30	4.56	16.64	35.31	47.32
	4	46	1.45	4.51	16.69	35.14	47.14
	5	46	1.58	4.48	16.73	34.98	46.96
	6	46	1.74	4.45	16.81	34.83	46.81

Table 2. Sensory quality attributes of tomato and orange juice blended squash during storage

Percentage of blends	Appearance		Colour		Flavour		Taste		Overall acceptability	
	0	180	0	180	0	180	0	180	0	180
10%	9.10	8.42	9.04	8.80	9.03	8.62	9.19	8.90	8.94	8.54
20%	9.20	8.94	9.08	8.72	9.10	8.75	9.32	9.00	9.02	8.72
30%	9.05	8.40	9.01	8.55	9.01	8.54	9.15	8.84	8.81	8.40

For pH determination, digital pH meter (Hart and Fischer, 1971). The reducing and total sugar content was determined by the method as described by Ranganna (1995). Ascorbic acid content was estimated by the 2, 6 dichloroindophenol dye titrimetric method (Mahadevan and Sridhar, 1982).

STORAGE STUDIES: To study the shelflife of squash was stored for six months at room temperature. The quality of squash was evaluated organoleptically on a 9-1 point hedonic scale for colour, flavour, taste and over all acceptability at intervals of 30 days for total period of six months.

RESULTS AND DISCUSSION

Data presented in Table 1, shows that the changes in chemical constituents of tomato and orange juice blended squash during storage period. The total soluble solids (TSS) was kept constant in all percentage of blends (10, 20 and 30%) throughout the storage period. Similar result was observed by Saravanakumar and Manimegalai (2003) the TSS content of strawberry squash was maintained at the end of the storage period of 180 days. A gradual increase in the acidity content of the squash samples were observed during storage. The initial acidity of the samples 1.02 in 10%, 1.00 in 20% and 1.01 per cent in 30% and had increased to 1.81, 1.58 and 1.74 per cent in 10, 20 and 30% at the end of the storage period. The initial pH of 10, 20 and 30% were noted as 4.55, 4.58 and 4.63 respectively which changed to 4.38, 4.46 and 4.45 for 10, 20 and 30% after 180 days of storage period. The pH of squash samples prepared from two varieties of strawberry give same result by Saravanakumar and Manimegalai (2003). A remarkable increase in the reducing sugar throughout the storage period. The initial reducing sugar content of 10, 20, and 30% were noted as 16.46, 16.49 and 16.54 g per cent at the end of the storage were 16.72, 16.59 and 16.81 g per cent respectively. Rakeshsharma *et al.* (2003) reported that dietetic plum seasoned squash had exhibited an increase in reducing sugar content in all treatments and kept at ambient conditions. Notable changes in the total sugar content of the squash prepared from 10, 20 and 30% incorporation were observed during storage. The initial total sugar content of 10% 35.58, 35.61 in 20% and 35.65 g per cent in 30% of blend respectively.

The corresponding values after 180 days of storage period were 34.79, 34.99 and 34.83 g per cent in 10, 20 and 30% incorporation. The strawberry squash prepared from Sujatha and Labella showed a decline in the total sugar content from 35.44 to 31.40 g per cent and 35.64 to 30.87 g per cent after storing for six months at room temperature Saravanakumar and Manimegalai (2003). The initial and final values of ascorbic acid content of tomato and orange blend squashes were 51.35 and 50.42 mg per cent for 10%, 49.17 and 48.49 mg per cent for 20% and 47.76 and 46.81 mg per cent for 30% of incorporation. Data on sensory qualities of tomato and orange juice blended squashes initially and after six months storage are presented in Table 3. The squashes had reddish colour, strong flavour and highly acceptable taste. As the storage period increased, the quality attribute score value for appearance, colour, flavour, taste and overall acceptability showed a decreasing trend. Squashes of 80%tomato and 20% orange juice blend recorded highest sensory qualities scores at par with other blends. Based on the result of these 180 days studies, it is concluded that blending of 80%tomato juice with 20% orange juice improved the nutritional as well as sensory qualities of squash which was found most acceptable upto 180 days of storage at room temperature.

REFERENCES

- Hart and Fischer 1971. Modern food analysis. Spirnger veslas. Bertin heiderberg, Newyork, P 64-66 and 74.
- Madaiah, N, Radhakrishnaih settey G, Krishna, M.S., Najundasamy, AM and Patwardhan, MV 1986. Ind. Food Packer, 40(3):6.
- Mahadevan, A and Srihar, R. 1982. Extraction and estimation of ascorbic acid methods in physiological plant pathology. Sivakami publisher, Madras, P.171.
- Rakeshsharma, V.S. Barwal and B.B. Lalkaushal, 2003. Preparation and evaluation of Dietetic plum seasoned squash. Beverage and food world, Feb, 30 (2).
- Ranganna, S. 1995. Manual analysis of fruit and vegetable products. Tata McGraw Hill publishing Co, New Delhi – P 2-3.
- Saravanakumar, R and G. Manimegalai, 2003. Delightful squash from temperate fruit strawberry. Beverage and food world, March, 30 (3).
- Swatiyandangi, 1995. Emerging trends in fruit juice beverages. University of Mysore Dissertatation, CFTRI, and Mysore 13.