IJASRM

International Journal of Advanced Scientific Research and Management, Special Issue I, Jan 2018.

www.ijasrm.com

ISSN 2455-6378

Standardization of Processing Technology for Guava/ Blended Guava (*Psidium guajawa* L.) Ev. Lucknow– 49 Ready-To-Serve Beverage

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Abstract

The present investigation entitled "Standardization of processing technology for Guava/ Blended Guava (*Psidium guajava L.*) ev. Lucknow-49- Ready-To-serve beverage" was carried out at the Post Graduate Laboratory of the Department of Horticulture, Junagadh Agricultural University, Junagadh during the year 2007-08. The experiment comprised of 12 treatments of recipe. The experiment was laid out in Completely Randomized Design with Factorial concept, with 3 replications. Among various treatment tried in this investigation, the RTS beverage of 15% blended guava juice with lime and ginger (17:2:1)+15% TSS + 0.25% acidity retained significantly highest score for colour, taste, flavour, appearance, product setting at bottom, overall acceptance up to fourth month of storage. The sensory rating parameters showed decreasing trend throughout the storage period. As far as the chemical parameters of the product is concerned during storage of RTS, the acidity, TSS, total and reducing sugar showed an increasing trend with increasing period of storage, while the ascorbic acid content and non-reducing sugar content showed decreasing trend under ambient conditions.

Key words: *Guava, beverage, summer season.*

1. Introduction

Guava (*Psidium guajava L.*) is one of the most common fruits in India. It claims to be the fourth most important fruit crop in area and production after mango, banana and citrus. Guava belongs to the large family of myrtaceae. Amongst about 150 species of genus Psidium only Psidiym guajava has been exploited commercially. Fruits are edible and have distinctive flavour similar to strawberry and pineapple. Much of the interest in common guava has been due to its delightful taste and flavours. It is the fruit that has often been referred to as the “apple” of tropics. Guava fruits remain available in the market for a limited period of time. When fruits are harvested at full matured stage or ripened stage, the shelf life of fruit is very short. So, for better and remunerative prices of guava fruits, value added product like RTS prove very useful. Therefore, the value addition of guava fruits becomes necessary in order to minimize the glut in the market during its peak season of production. For improving flavour, taste, palatability and nutritive value of guava, lime and ginger may be blend as these fruits with nutritional and medicinal properties. Therefore, the present investigation was conducted to standardize the processing technology for guava/blended guava ready to serve.

2. Material and Methods

The present investigation entitled “Standardization of processing technology for Guava/Blended Guava (Psidium Guajava L.) ev. Lucknow – 49 Ready-To-Serve beverages”
was carried out at the Post Graduate Laboratory of the Department of Horticulture. Junagadh Agricultural University, Junagadh during the year 2007-08. The experiment caoprised of 12 treatments of recire viz.,
10% Juice + 12% TSS + 0.25% acidity (T_1) 15% Juice + 12% TSS + 0.25% acidity (T_2) 20% Juice + 12% TSS + 0.25% acidity (T_3)10% Juice + 15% TSS + 0.25% acidity (T_4) 15% Juice + 15% TSS + 0.25% acidity (T_5) 20% Juice + 15% TSS + 0.25% acidity

(T_6) 10% blended juiCe of guava, lime and ginger (17:2:1) + 12% TSS + 2.05% acidity (T_7) 15% blended juiCe of guava, lime and ginger (17:2:1) + 12% TSS + 2.05% acidity (T_8) 20% blended juiCe of guava, lime and ginger (17:2:1) + 12% TSS + 2.05% acidity (T_9) 10% blended juiCe of guava, lime and ginger (17:2:1) + 15% TSS + 2.05% acidity (T_{10}) 15% blended juiCe of guava, lime and ginger (17:2:1) + 15% TSS + 2.05% acidity (T_{11}) and 20% blended juiCe of guava, lime and ginger (17:2:1) + 15% TSS + 2.05% acidity (T_{12})

Matured freshly harvested guava fruits of variety Lucknow – 49 were taken for experiment and the juice was extracted with enzymatic method for the preparation of RTS beverage. The prepared product was filled in glass bottles of 200 ml capacity and stored in dried place at anbient temperature for further study. The observation of different physic-chemical parameters were recorded at 0^{th}, 2^{nd} and 4^{th} months during storage.

Table 1. Effect of recipe on TSS content (%), acidity (%) and ascorbic acid (mg/100g) of guava a RTS beverage during storage.

Treatments	TSS content (%)			Acidity (%)			Ascorbic acid (mg/1000ml)		
	Storage periods (Months)			Storage periods (Months)			Storage periods (Months)		
	0	2	4	0	2	4	0	2	4
T_1	12.0	12.0	12.8	0.250	0.261	0.271	11.10	10.40	9.83
T_2	12.0	12.2	12.9	0.250	0.265	0.275	11.80	11.30	10.37
T_3	12.0	12.2	12.9	0.250	0.263	0.273	11.90	11.40	10.43
T_4	15.0	15.0	15.4	0.250	0.263	0.273	11.40	11.17	10.00
T_5	15.0	15.1	15.8	0.250	0.292	0.302	12.37	11.50	10.93
T_6	15.0	15.3	15.6	0.250	0.285	0.295	12.17	11.17	10.83
T_7	12.0	12.4	13.1	0.250	0.272	0.282	12.07	11.40	10.60
T_8	12.0	12.4	13.1	0.250	0.275	0.285	12.10	11.50	10.70
T_9	12.0	12.3	13.0	0.250	0.268	0.278	12.00	11.10	10.53
T_{10}	15.0	15.2	15.9	0.250	0.302	0.312	12.67	11.87	11.37
T_{11}	15.0	15.8	16.5	0.250	0.318	0.328	13.23	12.43	11.97
T_{12}	15.0	15.2	15.6	0.250	0.282	0.292	12.13	11.43	10.73
S. Em ±	-	0.3	0.3	-	0.005	0.005	0.17	0.15	0.14
C.D. At 5%	-	0.8	0.9	-	0.016	0.015	0.49	0.43	0.42
C.V.%	-	3.4	3.8	-	3.350	3.110	2.40	2.25	2.34

Table 2. Effect of recipe on reducing sugar (%), non-reducing (%) and total sugar (%) of guava RTS beverage during storage.

Treatments	Reducing Sugar (%)			Non-Reducing Sugar (%)			Total Sugars (%)		
	Storage periods (Months)			Storage periods (Months)			Storage periods (Months)		
	0	2	4	0	2	4	0	2	4
T_1	1.32	1.95	2.95	9.40	9.20	8.76	10.7	11.2	11.7
T_2	1.62	2.23	3.23	9.43	9.30	8.81	11.0	11.5	12.0
T_3	1.64	2.25	3.25	9.45	9.35	8.84	11.0	11.6	12.0
T_4	1.75	2.38	3.38	9.47	9.39	8.85	11.2	11.7	12.2
T_5	2.35	2.95	3.95	9.81	9.72	9.18	12.1	12.6	13.1
T_6	2.32	2.89	3.94	9.79	9.70	0.16	12.1	12.5	13.1
T_7	1.95	2.60	3.60	9.59	9.50	8.97	11.5	12.1	12.5
T_8	2.13	2.76	3.76	9.66	9.55	9.00	11.7	12.3	12.7
T_9	1.84	2.47	3.47	9.57	9.48	8.96	11.4	11.9	12.4
T_{10}	2.43	3.08	4.08	9.82	9.00	9.22	12.2	12.7	13.3
T_{11}	2.60	3.23	4.23	10.07	9.84	9.41	12.6	13.0	13.6
T_{12}	2.15	2.78	3.78	9.71	9.60	9.09	11.8	12.3	12.8
S. Em ±	0.04	0.06	0.05	0.11	0.08	0.11	0.1	0.1	0.1
C.D. At 5%	0.13	0.17	0.15	0.31	0.23	0.32	0.3	0.2	0.3
C.V.%	3.74	3.73	2.44	1.91	1.42	2.13	1.5	1.5	1.5

3. Results and Discussion

Chemical characteristic of ready-to serve

Total soluble solids

It is evident from the data that total soluble solid contend (TSS) of sapota RTS beverage is increased with the advancement of storage period up to 4 month in all the treatments of recipe (Table 1). The increase in TSS content of guava RTS beverage during storage

was probably due to conversation of free polysaccharides into soluble sugars. In conformity of this, similar result were reported in guava (6).

Acidity

The data presented in table 1 reveals the acidity of guava RTS beverage during storage increased with the advancement of storage period. The treatment T_{11} recorded the maximum acidity, which might be due to blending of guava, lime and ginger juice. (1) reported that the acidity was found to increase by blending apricot with plum juice whereas, it got reduced with apple juice and apple concentrate after six month of storage at ambient temperature, (5) also revealed that an increase in acidity in jack fruit during storage period of beverages.

Ascorbic acid

In present study the ascorbic acid content of guava RTS beverage was decreased as the storage period increased (Table 1). Among the various recipe treatments, the guava juice blended with lime and ginger juice exhibited higher initial ascorbic acid content. The decrease in ascorbic acid content was significantly influenced by different recipe treatment.

Table 3. Effect of recipe on color (score), taste (score) and flavour (score) of guava RTS beverage during storage.

Treatments	Color (Score)			Taste (Score)			Flavour (Score)		
	Storage periods (Months)			Storage periods (Months)			Storage periods (Months)		
	0	2	4	0	2	4	0	2	4
T_1	7.00	6.70	6.00	6.03	5.33	4.63	6.67	6.17	4.97
T_2	7.10	6.80	6.10	6.57	5.87	5.17	7.10	6.60	5.40
T_3	7.05	6.77	6.12	6.23	5.53	4.83	7.00	6.50	5.30
T_4	7.03	6.73	6.03	6.10	5.40	4.70	6.83	6.33	5.13
T_5	8.37	7.77	7.27	8.23	7.53	6.83	7.90	7.40	6.20
T_6	8.07	7.47	6.77	8.10	7.40	6.70	7.73	7.23	6.03
T_7	7.37	7.07	6.37	7.20	6.50	5.80	7.27	6.77	5.57
T_8	7.47	7.17	6.47	7.50	6.80	6.10	7.50	7.00	5.80
T_9	7.27	6.97	6.27	6.80	6.10	5.40	7.13	6.63	5.43
T_{10}	8.64	8.34	7.64	8.67	7.97	7.27	8.17	7.67	6.53
T_{11}	9.03	8.73	8.03	9.17	8.47	7.77	8.50	8.07	6.93
T_{12}	7.67	7.37	6.67	8.07	7.37	6.67	7.60	7.10	5.90
S. Em ±	0.12	0.13	0.13	0.14	0.15	0.12	0.11	0.12	0.10
C.D. At 5%	0.34	0.39	0.38	0.42	0.44	0.36	0.32	0.35	0.29
C.V.%	2.61	3.18	3.37	3.37	3.92	3.55	2.57	3.00	2.98

Table 4. Effect of recipe on appearance (score), product setting (score) and overall acceptability (score) of guava RTS beverage during storage.

Treatments	Color (Score)			Taste (Score)			Flavour (Score)		
	Storage periods (Months)			Storage periods (Months)			Storage periods (Months)		
	0	2	4	0	2	4	0	2	4
T_1	7.00	6.85	6.35	7.33	7.05	6.43	34.03	32.10	28.38
T_2	7.10	6.88	6.38	7.97	7.72	7.07	35.83	33.87	30.12
T_3	7.07	6.87	6.37	7.70	7.45	6.80	35.10	33.12	29.42
T_4	7.03	6.85	6.35	7.53	7.28	6.63	34.53	32.59	28.84
T_5	8.03	7.78	7.28	9.07	8.82	8.17	41.50	39.30	35.75
T_6	7.70	7.45	6.95	8.73	8.48	7.83	40.03	38.03	34.28
T_7	7.33	7.08	6.58	8.20	7.95	7.30	37.37	35.37	31.62
T_8	7.50	7.25	6.75	8.40	8.15	7.50	38.37	36.37	32.62
T_9	7.13	6.92	6.42	8.07	7.82	7.13	36.40	34.44	30.65
T_{10}	8.25	7.97	7.45	9.30	9.00	8.20	43.02	40.95	37.09
T_{11}	8.57	8.32	7.77	9.73	9.47	8.70	45.00	43.06	39.20
T_{12}	7.57	7.32	6.82	8.57	8.32	7.67	39.47	37.48	33.73
S. Em ±	0.10	0.12	0.11	0.14	0.14	0.16	0.41	0.40	0.40
C.D. At 5%	0.29	0.34	0.31	0.41	0.42	0.46	1.20	1.18	1.18
C.V.%	2.32	2.76	2.68	2.92	3.03	3.64	1.85	1.92	2.15

At the end of storage, the maximum retention of ascorbic acid content of 11.97 mg/100 ml RTS was recorded at T_{11} treatment [15% blended juice of guava, lime and ginger (17:2:1) + 15 % TSS + 0.25% acidity] as compared to T_1 (10% juice of guava + 12% TSS + 0.25% acidity) i.e. 9.83 mg/100ml RTS (Table 4). the decrease in ascorbic acidn in RTS during storage might be due to oxidation or irreversible conversion of L- ascorbic acid into dehydro ascorbic acid oxidase (ascorbimase). Similar reduction in ascorbic acid content have also been reported in guava beverage (7).

Sugars

The data record in present investigation indicated that reducing and total sugar content of guava RTS beverage were increased with in advancement of storage period up to 4 months. However, the rate of increase in reducing and total sugar content (Table 2) significantly affected by various study, the minimum reduction in value of product setting at bottom was record at T_{11} treatment i.e. 9.73 to 8.70. However, T_1 treatment exhibited highest reduction of value of product setting at bottom i.e. 7.33 to 6.43. It might be due to the less particle suspension in T_{11} recipe treatment and more particles suspension in T1 recipe treatment. Similar reports have been made by (4) in the RTS with sapota blended juice with lime.

Overall acceptance

The application of various recipe treatments significantly affected the overall acceptance of the product during entire period of storage (Table 3). In the present study, the minimum reduction in overall acceptance record at T_{11} treatment (15% blended with guava lime and ginger (17:2:1) + 15% TSS + 0.25% acidity) i.e. 45.00 to 39.20. However, T_1 treatment (10% juice of guava 12% TSS + 2.05% acidity) exhibited highest reduction of overall acceptance i.e. 34.03 to 28.38. Similar reports have been made by (10) who concluded that blending of 30 percent papaya juice with 70 percent guava juice improved the nutritional wuality and overall acceptance of RTS beverages.

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