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Utilization of Apple Juice Concentrate for Canning of Peach Slices

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ABSTRACT Peach (*Prunus persica* Batsch) grown extensively in the states of Himachal and Jammu and Kashmir for its dessert and canning qualities. Unfortunately, its shelf-life is only 2-4 weeks at 0° C and keeping in view the modest transport facilities, it is emphasised that the fruit is canned at or near the growing regions to avoid wastage and bring more remuneration to the growers. Since, Himachal Government has set up many apple processing units at different locations, and attempt is previously made here to use apple juice concentrate as syrup medium in place of cane sugar for canning of peach slices to make optimum use of the existing facilities.

INTRODUCTION

Peach (*Prunus persica* Batsch) is grown extensively in the state of Himachal Pradesh and Kashmir. It is valued for its desset and canning qualities. It is highly perishable in nature, usually have shelf-life of only 2 to 4 weeks is held at about 0°C and 90 to 95 relative humidity. If not properly handled the fruit may be rendered unfit for local market within 4-5 days after harvest. Therefore, to make best use of this fruit at right time and increased income to the farmers, preservation provides a good alternative. This can prevent the seasonal glut and make the availability of such fruit at reasonable costs throughout the year. And at the same time provides an additional income to the growers especially for the inferior fruit. Himachal is also an apple producing state. With the help or World Bank Aid, large scale processing units have been established primarily for the production of apple juice concentrate, when all the processing plants starts producing apple concentrate the industry might face a surplus of this speciality product. So some more meaningful and profitable outlets have to be developed for the consumption of apple juice concennntrate. In the processing industry, it is customary that peach slices/halved are canned in sugar syrup. Keeping in view the present conditions, the rate and availability of sugar in the market, the product tends to become costilier and uneconomical to process and consume. So in the present investigation to make an additional outlet for the use of surplus apple concentrate, an attempt was made to use apple juice concentrate as syrup media in lieu of can sugar in the processing of peach slices.

MATERIAL AND METHODS

The objectives of this study was to determine a possible substitute of sugar in the canning of peach slices with apple juice concentrate. The dilution of apple concentrate was done by the apple juice (both clarified and non-clarified) and water to achieve the desired concentrations. The peaches (Elberta) were procured from Rajgarh while the apple juice concentrates and apple fruit were supplied by HPMC Organisation. Peach fruit was sorted, washed, lye-peeled, halved, pitted, filled in cans and then covered with different syrup concentrations, exhausted, sterilized, cooled and stored at room temperature. The main treatments and substreatments were worked out its given below.

S.No.	*Treatment*	*Concentration of Syrup*
1	T_1	68 oB (No dilution, used as such)
2	T_2	40 oB (Reconstituted with water)
3	T_3	40 oB (Reconstituted with non-clarified juice)
4	T_4	40 oB (reconstituted with clarified juice)
5	T_5	25 oB (Reconstituted with water)
6	T_6	25 oB (Reconstitulted with non-clarified juice)
7	T_7	25 oB (Reconstituted with clarified juice)
8	T_8	(Control) 40 oB (Sugar Syrup)

The chemical analysis of the product was done for various parameters *viz.* ascorbic acid (Table 1) total soluble solid (Table 2) reducing sugars (Table 3) total sugars (Table 4), pH (Table 5), subsequently after 15,30,45, 60,150 and

Table 1: Ascorbic acid (mg/100gm) at different storage interval

Treatment	Storage (day)					
	15	30	45	60	150	240
T_1	5.74	5.80	4.39	4.00	3.79	3.47
T_2	4.46	3.57	2.19	2.00	1.86	1.62
T_3	4.54	4.39	3.33	3.02	2.82	2.50
T_4	4.39	3.63	2.10	2.09	1.85	1.71
T_5	1.39	3.41	2.27	2.18	2.01	1.81
T_6	4.31	3.94	2.27	2.20	1.86	1.62
T_7	4.39	3.78	2.19	2.11	1.86	1.53
T_8	4.09	2.12	1.96	1.85	1.54	1.31
CDat5%	0.3	1.30	0.57	0.46	0.42	0.39
CDat1%	0.41	1.81	0.80	0.61	0.57	0.46

Table 2: Total soluble soluble solids (%TSS) at different storage inverals

Treatment	Storage (day)					
	15	30	45	60	150	240
T_1	4.00	38.0	30.0	36.0	31.0	28.0
T_2	23.1	21.5	20.5	19.6	17.0	14.0
T_3	26.1	20.3	19.7	18.0	15.0	13.0
T_4	20.7	20.5	19.9	18.0	15.2	13.4
T_5	16.0	15.8	14.3	13.0	11.4	9.2
T_6	15.2	13.5	13.5	13.0	12.8	10.1
T_6	15.2	13.5	13.5	13.0	12.8	10.1
T_7	15.6	15.4	14.7	14.2	13.0	11.6
T_8	21.4	21.1	20.3	19.8	16.0	14.2
CDat5%	4.67	0.42	0.46	0.48	0.44	0.38
CDat1%	6.48	0.59	0.64	0.68	0.60	0.48

Table 3: Per cent reducing sugars at different storage invervals

Treatment	Storage (day)					
	15	30	45	60	150	240
T_1	31.64	29.56	26.32	23.00	18.90	15.02
T_2	17.26	14.15	12.38	11.02	9.44	7.66
T_3	16.74	13.53	13.47	12.62	10.22	8.79
T_4	15.42	14.81	14.06	13.69	11.32	9.92
T_5	11.12	10.95	9.22	9.02	7.95	6.85
T_6	11.56	10.32	9.59	9.30	7.99	6.90
T_7	9.80	9.21	8.88	8.00	7.55	6.8
T_8	9.28	7.46	7.43	7.01	6.42	6.02
CDat5%	0.36	0.65	NS	0.32	0.74	0.80
CDat1%	0.50	0.90		0.43	0.97	0.99

240 days of storage intervals and the results are depicted in tables.

In the present investigation several treatments did show encouraging results when compared with control. Best results have been obtained from samples of treatment T_1 (68 Brix

Table 4: Per cent total sugars at different storage invervals

Treatment	Storage (day)					
	15	30	45	60	150	240
T_1	34.35	32.21	27.16	24.82	19.95	16.82
T_2	19.02	18.74	15.16	14.02	10.85	8.56
T_3	17.43	15.91	15.56	14.62	12.33	9.85
T_4	17.99	16.05	15.54	14.67	12.56	9.70
T_5	14.69	13.82	10.01	8.89	9.02	8.26
T_6	14.39	13.69	11.43	10.82	9.30	8.79
T_7	14.99	13.30	10.70	9.69	8.21	7.66
T_8	20.09	19.41	15.41	13.76	10.09	8.72
CDat5%	0.03	0.60	0.63	0.67	0.76	0.62
CDat1%	0.42	0.84	0.88	0.94	0.99	0.86

Table 5: pH at different storage invervals

Treatment	Storage (day)					
	15	30	45	60	150	240
T_1	3.57	3.52	3.44	3.44	3.40	3.36
T_2	3.53	3.53	3.49	3.47	3.45	3.39
T_3	3.67	3.62	3.55	3.55	3.51	3.46
T_4	3.68	3.58	3.50	3.50	3.46	3.41
T_5	3.55	3.53	3.42	3.40	3.36	3.30
T_6	3.60	3.60	3.53	3.50	3.45	3.40
T_7	3.70	3.68	3.61	3.58	3.54	3.49
T_8	3.49	3.42	3.38	3.34	3.30	3.22
CDat5%	2.91	NS	0.05	0.04	0.05	0.03
CDat1%	3.94		0.07	0.06	0.06	0.05

followed by T_2 (40 Brix reconstituted with water) gave better results followed by T_6 (26 Brix) reconstituted with non-clarified juice) and T_7 (25 brix reconstituted with clarified juice). The difference in results of T_5 and T_6 were pretty closed and statistically non-significant . Therefore, T_5 has been recommended as an acceptable treatment for practical purposes. In most of the parameters treatment T_1 (68 Brix) did show good result but economically it was not viable to process peaches in straight apple juice concentrate (68 Brix). Pangborn et al. (1959) also found quite encouraging results by replacing sugar syrup with corn syrup in the canning of fruits. Similar results have also been reported by Kreutizing (1980). No doubt the sugar in the preservation of peaches help to maintain the natural fruit flavour and colour, yet other packing media can be used. This also gives credence to the findings of judge in 1976 and Cyprus organisation for standards and control of quality of canned peaches (Anonymous, 1979). Of course, such addition alters the flavour and colour of the preseve a little but are usually preferable

because they make the product more nutritious.

CONCLUSION

From the foregoing discussion, it is successfully concluded that apple juice concentrate can be procured which has a general consumer acceptance. Moreover, the burden of sugar industry can be decreased if consumption of sugar is reduced from the processing industry. It is hoped, the results would be great-benefit for the gorwers, processors, research workers and other interested in this field.

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