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Short communication

Standardization of process for preparation of banana fruit bar

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In India, the post-harvest losses in banana is estimated to an extent of 20-30% and majority of losses (60-70%) occur after ripening of fruit during its retailing (2). Often large quantities of unmarketable ripe fruits are dumped into the garbage or fed to cattle due to poor storage facilities causing a loss of around Rs. 500 crores every year. These wastes and other unmarketable surpluses can be converted into value added products like fruit bar, jam and sweet chutney. Fruit bar is a confectionery item prepared by drying fruit pulp after mixing with appropriate quantities of sugar, pectin, acid and colour. Most of the commercially available fruit bars except mango leather are synthetic in nature and without fruit pulp. Natural fruit pulp based fruit bars are more nutritious and tasty since substantial quantities of dietary fibres, minerals and vitamins are present. Though considerable information is available on mango fruit bar, information on banana fruit bar is lacking. Therefore, a preliminary investigation was carried out to standardize the recipe and process for preparation of banana fruit bar.

Ripe and over-ripe banana fruits of Karpuravalli variety (Pisang Awak, ABB group) which is widely grown in India and other countries like Philippines was selected in this study. The fruits were peeled and the pulp was blended into a smooth paste in an electric blender. Additives like sugar, citric acid, pectin and colour (Sunset Yellow) were added to the pulp in different combination as treatments based on pulp weight and replicated five times. Treatments were: T1 = 20% sugar + 0.5% pectin + colour, T2 = 20% sugar + 0.5% pectin + colour + 0.3% citric acid and T3 = Pulp alone without any additives. Potassium metabisulphite (KMS) at a rate of 350 ppm was added uniformly to all the treatments. The pulp and the additives were mixed thoroughly and poured into aluminum trays which were smeared with *ghee*. The trays were kept in hot air oven at 70°C for 18 hours. The dried sheet of fruit bar was lifted from the trays and turned to allow uniform drying for another 10 hours. After drying, the fruit bar sheet was cut into different shapes using a biscuit cutter, packed in small polyethylene pouches and stored at room temperature. Various physico-chemical quality parameters like moisture, acidity, reducing sugars, total sugars, non-enzymatic browning, microbiological quality like total plate count and sensory qualities like colour, flavour, texture and taste were analyzed immediately after preparation of fruit bar adopting the standard procedures (Ranganna, 5; Amerine *et al.,* 1). The data were analyzed adopting completely randomized design (Chandel, 3).

The moisture content was significantly lower in the treatment without any additives (T3) than the other two treatments (Table 1). Due to lower moisture content in T3, the texture was also hard. The pliable texture in T1 and T2 samples was due to better binding of moisture in presence of higher sugar content. The non-enzymatic browning (NEB) units were significantly higher in T1 and T2 than T3 which may be due to the presence of higher sugar content in these treatments. The acidity was highest in T2 sample, which was due to external addition of citric acid. The reducing and total sugars were highest in T1 followed by T2 which was due to addition of sugar to these samples while it was lowest in T3. Among the microbial population, only a few colonies of yeast (about 2.1 cfu/g) were noticed while mould and bacteria were totally absent. The results on the organoleptic quality indicated that the colour of the product was best in samples where sunset yellow colour was added while the colour was dirty white in T3 which was the least preferred. Similarly, the score for flavour was more in T1 and T2 than T3 and was unacceptable. This could be due to addition of sugar, which improved the sweetness, sugar: acid ratio and taste. The texture score was the highest in T1, which was due to higher moisture and better palatability than the rest of the samples. The score for the taste was the highest in T1 (7.22), which had a better sugar : acid ratio as compared to T2, which was more acidic while the taste of T3 was unacceptable. The overall acceptability score showed no significant difference between T1 and T2 while T3 was totally unacceptable. Similar observations with regard to the chemical composition and organoleptic quality were reported by Doreyappa Gowda *et al.* (4) in mango fruit bar. Thus, it is concluded from this study that a tasty banana fruit bar could be prepared by mixing 20% sugar, 0.5% pectin and 350 ppm potassium metabisulphite with smoothly blended pulp of Karpuravalli banana.

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Table 1. Physico-chemical, microbiological and sensory quality of Karpuravalli banana fruit bar as affected by different treatments.

Quality parameter	Treatments			SEm ±	CD at 5%
	T1	T2	T3		
Moisture (%)	28.00	26.50	16.11	0.084	0.182
Non-enzymatic browning (OD units)	0.58	0.53	0.101	0.001	0.003
Acidity (%)	1.38	2.41	1.591	0.008	0.018
Reducing sugar (%)	15.61	14.89	14.01	0.036	0.079
Total sugars (%)	51.71	49.41	45.59	0.153	0.333
No. of colonies of yeast (cfu/g)	2.00	2.14	0.86	0.191	0.415
Colour score (out of 9)	7.18	7.13	4.73	0.189	0.412
Flavour score (out of 9)	6.87	6.58	4.74	0.125	0.272
Texture score (out of 9)	6.28	5.72	3.44	0.154	0.336
Taste (out of 9)	7.22	6.39	4.33	0.186	0.405
Overall acceptability score (out of 9)	6.79	6.67	4.50	0.136	0.297

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