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Preparation and Evaluation of Olive Apple Blended Leather

Review Article

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Abstract

The aim of the study was to evaluate a suitable combination of olive and apple pulp for the preparation of olive apple blended leather, stored at ambient temperature. The treatments were T_0, T_1, T_2 and T_3. The samples were wrapped in aluminum foil and then packed in polyethylene plastic bags and evaluation was carried out for a total period of 150 days. Physiochemically analysis; acidity and moisture and sensory characteristics; color, texture, taste and overall acceptability (using Larmond Scale) were evaluated at 30 days interval. A significant decrease was recorded in moisture (from 13.60% to 11.53%), color (from7.20 to 4.60), taste (from 7.53 to 5.40), texture (from 7.23 to 5.13) and overall acceptability (from 7.33 to 4.85). A significant increase was recorded in acidity (from 0.67% to 0.84%). Among all the treatments T_3 was found most acceptable both physiochemically and organoleptically.

Keywords: olive fruit, leather, apple, storage

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Introduction

Fruit leathers are fruit base dehydrated product. They are chewy and tasty dried slabs made by putting fruit pulp into a mouldy surface. On drying it is put out and rolled. It has given the name due to its leathery appearances. Making leather benefits, in utilizing less sugar and more fruit flavors, useful for diabetic and health conscious consumers. Leather can be made from individual and mixed fruit in any proportion. It can be prepared from fresh, frozen and canned fruit. Drying of fruit leather involves removing of moisture, thus microbes can't grow. It also inactivates enzymatic activities. Moisture reduction makes it shrinked to occupy less space and facilitate transportation.

Olive (olea europaea L) is small tree fruit grown in temperate zones. Olive fruit is famous for its nutritious edible oil with a lot of health benefits. Other constituents are water, sugar, protein, oleouropein and anthocyanins. Oleouropein cause bitterness, must be removed (Gruenwald, 1998). Composition of olive fruit, moisture 65 to 75%, lipids 10-15%, reducing sugar 3-6%, non reducing sugar < 0.3%, fiber 1- 4% and protein 1-2 % (Garrido et al., 1997)

Apple (Malus Sylvestris) is a member of rosaceae family grown worldwide. Nutrition facts involve 84.7% water, 13.9gm carbohydrates, 0.3gm lipids, 0.4gm protein and vit.C 8mg per 100 from of edible fruit (Hussain 2001). Apples are rich source of antioxidants including flavoniods and polyphenols mainly occurs in its skin. Thus eating whole apple is recommended to obtained full health benefits (Hussain 2001).

Materials And Methods

The diseased free fruit was selected and washed with water in order to remove dust, and any other foreign material. Olive fruit was dipped in 2% Sodium Hydroxide for 36 hours in order to remove the bitterness. After that fruit was washed several times with water so that the bitterness completely finished. After removal of bitterness pulp was obtained through pulper machine. Similarly apple fruit was washed, peeled, trimmed, cut and dipped in 1% citric acid to prevent oxidation. Then the fruit was blended in order to get the pulp. Treatments of 20 degree brix were prepared by the addition of 0.1% sodium benzoate. After making fruit leather were wrapped in aluminum foil and packed air tightly in plastic bags. The leathers were kept at room storage for 5 months and studied at each interval of 30 days.

Chemical analysis

During room storage the leather were analyzed chemically for moisture and acidity by standard method of AOAC (2012).

Organoleptic evaluation

The olive apple blended fruit pulps were analyzed for color, taste, texture and overall acceptability by 10 panels of judges by using 9 points hedonic scale of larmond (1977).

Statistical analysis

The data were subjected to statistical analysis using 2-factorial CRD (Completely Randomize Design) and the means were differentiated by LSD (Least Significant Design) test 0.05% significant

level as defined by Steel and Torrie (1997).

Results And Discussions

Chemical analysis

The moisture content of olive apple blended leather during storage of 150 days is indicated in table (1). The treatment and storage considerably affect the moisture content of the product. All the samples experienced moisture reduction during storage which might be due to evaporation from the samples surface (Ashaye et al., 2005; okilya et al., 2010).

The acidity content of olive apple blended leather sample showed significantly increased with each storage interval. Increased in acidity was reported by Ekanayake and Bandara (2002) in banana leather. This increase is due the methyl esterase activity which converts pectin in pectic acid. Reduction in moisture also increased the acidity of the dried product (Rao and Roy, 1980; Effah-Manu et al., 2013).

Sensory analysis

Leather was prepared from combination of olive and apple pulp in different proportion. All the samples were analyzed organoleptically for color, texture, taste and overall acceptability.

Table (3) revealed considerable ($P<0.05$) decline in color of the leather samples. Incorporation of 30 to 50% apple pulp did have much effect on color of the leather as represented (Table 3). Higher value of decrease was found in OA_o was (30.00%) while lower deceased was shown by OA_3 (17.39%). Color acceptability rating of the leather decreased with increase in drying time (Bauernfeind et al., 1981; Korkida et al., 1998).

Mean score of the judges for taste of the leather sample was significantly ($P<0.05$) effected by the increasing proportion of apple pulp (30 to 40%). Table 4 represented color score of the olive apple blended fruit leather. Maximum declined in taste was revealed in OA_o (30.16%) while minimum decrease was noticed in OA_3 (16.22%). The taste of leather is contributed to the sugar content in fresh pulp. High amount of sugar beyond optimum level, may affect the taste score of the product (Jain and Nema. 2007). Sweetness rating may also depend on the type of fruit and may also vary during storage (Ashaye et al. 2005). However, guava leather and pawpaw leather shown maintain acceptable sweetness ratings within a study period of two months (Babalola et al., 2000). Mean score of olive apple blended leather for texture decreased during the storage interval from 6.70 to 5.08. Highest fall in texture value was recorded in OA_o (32.73%) followed by OA_1 (26.15%), while minimum decrease occur in OA_3 (16.05%) followed by OA_2 (25.37%). The results are in agreement with the conclusions of Babalola et al. (2000) who reported that High temperatures and long drying times are associated with lower moisture content and harder texture. Differences in texture of leathers could also be due to variations in genetic makeup of the fruit, rate of water absorption from the surroundings and protein content of the fruit among others. The overall acceptability olive apple blended fruit leather was significantly affected ($P < 0.05$). This shows that addition of apple pulp to leather were found more acceptable as compared to leather without apple fruit. General comments by panellists indicated that laboratory made mango-sweet potato leather was "aesthetically appealing, very fruity, and sweet". Overall acceptability generally related to all sensory attributes. It is reported that the acceptability of fruits and vegetables is influenced by their aroma by Karmas and Harris. (1998). Similar results were found by Iman et al. (2011) during physio chemical analysis and quality evaluation of intermediate moisture in apple slices.

Conclusion

In this research, olive apple blended leather was prepared at different ratio of olive and apple. From this study it is concluded that leather T_3 (olive pulp (50%) + apple pulp (50%) + 0.1% sodium benzoate) was accepted both organoleptically and physiochemi-

Table 1. Effect of treatment and storage interval on moisture content of olive apple blended leather

Treatments	Storage Intervals (Days)						% decrease	Mean
	Initial	30	60	90	120	150		
Moisture rate								
OA0	12.3	11.9	11.3	10.9	10.3	10	18.7	11.12
OA1	13.8	13.4	13	12.8	12.3	11.7	15.22	12.83
OA2	14	13.7	13.1	12.8	12.4	12	14.29	13
OA3	14.3	14	13.6	13.2	12.8	12.4	13.29	13.38
Mean	13.6	13.25	12.75	12.43	11.95	11.53		

Table 2. Effect of treatment and storage interval on % acidity of olive apple blended leather

Treatments	Storage Intervals (Days)						% Increase	Mean
	Initial	30	60	90	120	150		
% Acidity rate								
OA0	0.33	0.35	0.38	0.41	0.45	0.49	32.65	0.4
OA1	0.42	0.44	0.47	0.5	0.52	0.55	23.64	0.48
OA2	0.46	0.49	0.51	0.54	0.57	0.6	23.33	0.53
OA3	0.49	0.53	0.56	0.59	0.61	0.63	22.22	0.57
Mean	0.43	0.45	0.48	0.51	0.54	0.57		

Table 3. Effect of treatment and storage interval on color score of olive apple blended leather

Treatments	Storage Intervals (Days)						% decrease	Mean
	Initial	30	60	90	120	150		
Color score								
OA0	5	4.6	4.3	4	3.7	3.5	30	4.18
OA1	5.7	5.3	4.9	4.7	4.4	4.1	28.07	4.85
OA2	6.3	5.8	5.5	5.2	4.9	4.6	26.98	5.38
OA3	6.9	6.7	6.4	6.1	5.9	5.7	17.39	6.28
Mean	5.98	5.6	5.28	5	4.73	4.48		

Table 4. Effect of treatment and storage interval on taste score of olive apple blended leather

Treatments	Storage Intervals (Days)						% decrease	Mean
	Initial	30	60	90	120	150		
Taste score								
OA0	6.3	5.8	5.4	5	4.7	4.4	30.16	5.27
OA1	6.5	6.3	6	5.7	5.4	5.1	21.54	5.83
OA2	6.8	6.5	6.3	6.1	5.8	5.5	19.12	6.17
OA3	7.4	7.1	6.8	6.5	6.3	6.2	16.22	6.72
Mean	6.75	6.43	6.13	5.83	5.55	5.3		

Table 5. Effect of treatment and storage interval on texture score of olive apple blended leather

Treatments	Storage Intervals (Days)						% decrease	Mean
	Initial	30	60	90	120	150		
Texture score								
OA0	5.5	4.8	4.5	4.2	4	3.7	32.73	4.45
OA1	6.5	6.1	5.8	5.4	5	4.8	26.15	5.6
OA2	6.7	6.4	5.9	5.5	5.2	5	25.37	5.78
OA3	8.1	7.9	7.6	7.3	7.1	6.8	16.05	7.47
Mean	6.7	6.3	5.95	5.6	5.33	5.08		

Table 6. Effect of treatment and storage interval on overall acceptability score of olive apple blended leather

Treatments	Storage Intervals (Days)						% decrease	Mean
	Initial	30	60	90	120	150		
Overall acceptability score								
OA0	5.3	4.6	4.3	4.1	3.8	3.5	33.96	4.27
OA1	5.7	5.5	5.3	5.1	4.8	4.5	21.05	5.15
OA2	6.9	6.5	6.3	6	5.7	5.5	20.29	6.15
OA3	7.2	6.9	6.6	6.4	6.2	5.9	18.06	6.53
Mean	6.28	5.88	5.63	5.4	5.13	4.85		

cally as compared to others.

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