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Standardization of Technology for Preparation of Candy from Ripe Papaya (*Carica papaya* Linn.) Fruits

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ABSTRACT: The aim of this research experiment is to develop osmotic dehydrated candy from ripe papaya by utilizing of ripe papaya for its excellent nutritional value. Value addition from ripe papaya is negligible hence it is utilized for the preparation of osmotic dehydrated product. The present study was carried out for preparation of candy from ripe papaya (*Carica papaya* Linn.) fruits cv. Taiwan Red Lady by osmosis using different treatments viz, osmosis in 500 g, 750 g and 1000 g sugar/kg pieces as well as 50°B, 60°B and 70°B TSS sugar syrup/kg pieces followed by air dehydration. The observations for physico-chemical as well as organoleptic properties of candy were studied at interval of two months up to 6 months and data were analyzed in Completely Randomized Design with four repetitions. The results revealed that the mass transfer out and mass transfer in of papaya candy were increased gradually during osmotic treatment up to four days. During storage of six months at ambient condition the acidity, carotene, moisture and ascorbic acid content of papaya candy decreased whereas, total and reducing sugars increased with the advancement of storage period. Although the sensory characters of candy exhibited a gradual decline but were acceptable up to a period of six months.The results of the study revealed that the papaya candy prepared by mixing of 1 kg syrup (50^{o}B) per kg pieces remained shelf stable up to six months and found more acceptable on the basis of sensory scores and higher retention of physico-chemical composition.

Keywords: Candy, Osmosis, Osmotic-dehydration, Papaya, Papaya Candy, Storage.

INTRODUCTION

The papaya (*Carica papaya* Linn.) belongs to the family Caricaceae is an important table fruit of tropical world which gives higher production of fruits per hectare next to banana. The production of papaya in Indiais about 59.51 lakh MT from 1.44 lakh hectares having productivity 41.3 MT/ha. (Anon, 2021).Papaya is a common man's fruit which is reasonably priced and has high nutritive value. It is low in calorie and rich in vitamins and minerals. Moreover, the ripe papaya fruits contains water (88 g/100g), carbohydrate (10.82 g/100g) and Protein (0.47g/100g) and are known to be a rich source of phyto-nutrients, potassium (182 mg/100 g), calcium (20 mg/100g), dietary fibers (1.7g/100g), vitamin A (950 IU) and Vitamin C (60.96 mg/100g) (Pinnamaneni, 2017). Apart from using as a dessert fruit, a variety of products such as tutti-frutti, jam, jelly, sauce, toffee, bar, leather, pickles, crystallized fruits and dried slices may also be prepared from unripe or ripe papaya fruits. However, due to inadequate facilities for post harvest handling, storage, processing and preservation, still the post-harvest losses are reported to be around 30%. Hence there is a need to take up scientific handling and post harvest management including processing to reduce the losses. Therefore, considering the nutritional as well as organoleptic value, the experiment was conducted to prepare candy from ripe papaya fruits with the objectives to standardize the process for preparation of candy from ripe papaya fruits and to study the quality parameters of developed product (candy) during storage.

MATERIALS AND METHODS

The experiment was conducted at the Centre of Excellence on Post Harvest Technology, ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari. Thefully matured papaya fruits cv. Taiwan Red Lady were collected from RHRS (Regional Horticulture Research Station), Navsari Agricultural University, Navsari. The fruits are allowed to ripe at room temperature. The ripe fruits were washed, peeled and cut into uniform sized cuboids by using slicer and dicer. The data were analysed statistically using CRD with four repetitions.

Treatment No.		Description
T_1	=	Mixing of 500 g sugar / kg pieces
T_2	=	Mixing of 750 g sugar / kg pieces
T_3	=	Mixing of 1000 g sugar / kg pieces
T_4	=	Mixing of 1 kg 50° Brix syrup / kg pieces
T_5	=	Mixing of 1 kg 60° Brix syrup / kg pieces
T_6	=	Mixing of 1 kg 70° Brix syrup / kg pieces

Strength of all treatments was increased by 10° Brix every day till 70° Brix. Size of pieces/cuboids were 1.5 cm × 1.5 cm having thickness of 1.0 to 1.5 cm. After completion of osmosis, candy was rinse with warm water and dried at 60^o C temperature in hot air dryer. Prepared candy was packed in polypropylene bags having 400 gauge and stored at ambient temperature for six months.

Process Flow chart:

Selection of fully mature ripe papaya fruits
↓
Washing
↓
Peeling
↓
Cutting into required size of cuboids
↓
Addition of sugar / syrup as per treatments
↓
TSS of syrup increased by 10° B every day till 70° B
↓
Quick Rinsing in warm water
↓
Drying at 60° C
↓
Ripe papaya candy
↓
Packaging
↓
Storage

The prepared product was periodically analysed for chemical as well as organoleptic evaluation at interval of 2, 4 and 6 months of storage. The candy was analysed for different physico-chemical parameters *viz*; mass transfer out and in (%),acidity (%), TSS (^{o}Brix), carotene content (mg/100g), moisture (%), ascorbic acid (mg/100g), total and reducing sugars (%)according to the procedure reported by Ranganna (1997). The sensory parameters *viz*; colour, texture, flavour, taste and overall acceptability based on 9 point Hedonic scale (Amerine *et al.,* 1965).The data obtained were statistical analysed as per Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The experiment was conducted at Centre of Excellence on Post Harvest Technology, ACHF, NAU, Navsari as per treatments and process flow chart described ahead. Overall findings were presented here under to support the conclusion. The nutritional properties of freshripe papaya fruits before processing were noted in table 1.

Table 1: Physico-chemical characteristics of papaya fruits used for candy processing.

Parameters	Value
Acidity %	0.16
TSS ^{0}Brix	11.60
Carotene (mg/100g)	63.42
Moisture %	87.40
Ascorbic acid (mg/100g)	34.43
Total sugars %	10.11
Reducing sugars %	7.87

(a) Mass transfer in and out (%). The mass transfer in was calculated on the basis of solid gain (g) in the candy during osmosis dehydration and mass transfer out was calculated on the basis of amount of moisture removed (g) from the candy during osmosis and expressed as per cent mass transfer-in and per cent mass transfer-out.Data presented in Table 2 shows the mass transfer in and mass transfer out of papaya candy during osmosis process which were gradually increased up to four days. Significantly highest mass transfer in from candy was noted in candy prepared by using 1000 g sugar per kg of piece (T_3)(10.59 to 17.18%) while, minimum in candy prepared by using 1 kgsyrup (50^{o}Brix) per kg of piece(T_4)(6.71 to 12.59%), which might be due to slow osmosis process by sugar syrup having strength 50^{o}Brix.It also may be due to solute gain increased with increase in osmotic solution concentration is mainly because of high concentration difference between beet root and osmotic solution (Falade and Igbeka, 2007). However, mass transfer out of candy was found maximum in candy prepared by using 1 kgsyrup (70^{o}Brix) per kg of piece (T_6) (31.24 to 38.37%) for three days which was at par with treatment T_3 and while, it was highest in treatment T_3 (39.61%) at fourth day of osmosis. The minimum mass transfer out was observed in candy prepared by using 1 kg syrup (50^{o}Brix) per kg of piece (T_4) during osmosis up to 3 days. This might be because of the fact that the increase in temperature decreases the viscosity of the osmotic solution and thus reduces the external resistance to mass transfer at product surface to facilitate the outflow of water through cellular membrane (Panades *et al*., 2006). The similar findings were noted by Falade *et al*. (2007) in osmo-dehydrated watermelon. Minimum mass transfer out leads to higher retention of nutrients so the treatment T_4 was found best with higher retention of nutritional properties without damaging the texture of pieces.

Table 2: Effect of different sugar/syrup treatments on mass transfer in (%) and out (%) from pieces of ripe papaya fruits.

	Mass transfer in (%)					Mass transfer out (%)				
Treatment	**1st day**	**2nd day**	**3rd day**	**4th day**	**Mean**	**1st day**	**2nd day**	**3rd day**	**4th day**	**Mean**
T_1	8.14	10.06	11.80	13.96	10.99	26.08	31.99	36.22	36.83	32.78
T_2	9.08	12.13	13.34	13.71	12.07	27.07	32.52	35.16	36.85	32.90
T_3	10.59	12.71	15.72	17.18	14.05	30.23	35.57	37.97	39.61	35.85
T_4	6.71	8.41	10.49	12.59	9.55	25.36	30.07	32.92	35.16	30.88
T_5	7.90	8.70	10.16	12.65	9.85	26.68	30.68	34.02	34.83	31.55
T_6	9.61	12.30	14.37	16.75	13.26	31.24	35.84	38.37	38.36	35.95
SEm ± (T)	**0.493**	**0.553**	**0.421**	**0.883**		**0.714**	**0.826**	**0.854**	**0.576**	
CD @ 5% (T)	**1.794**	**2.010**	**1.532**	**3.211**		**2.597**	**3.004**	**3.104**	**2.095**	
CV %	**3.100**	**2.690**	**2.570**	**2.310**		**1.170**	**0.990**	**0.940**	**0.830**	

(b) Total Soluble Solids/TSS (°Brix). TSS of the candy was noted by using hand refractometer and expressed as ^{o}Brix at 20^{o}C using reference table for temperature. Data shows that among different treatments the grand mean TSS of carrot candy ranged from 70.15°Brix to 70.41°Brix, with minimum TSS (70.15°B) in candy prepared by using 1000 g sugar per kg pieces (T_3) while, maximum TSS (70.41°B) in candy prepared by using 1 kg syrup (50°Brix) per kg pieces (T_4). However, the effect of sugar/syrup treatments was found non-significant. TSS of candy was adjusted to 70^{o} B while prepared but, negligible changes were observed as it is slightly increased during storage (Table 3). The increase in TSS might be due to reduction of moisture content in product during storage. The increase in TSS during storage in the present investigation are in line with the observation reported by Singh and Gautam (2010) for pineapple candy and Nayak *et al.,* (2012) for *aonla* candy.

Table 3: Effect of different sugar/syrup treatments on TSS (^{o}B) of papaya candy.

Treatment	TSS (^{o}B)				Mean
	0 Months	2 Months	4 Months	6 Months	
T_1	70.17	70.26	70.41	70.18	**70.26**
T_2	70.17	70.22	70.18	70.47	**70.26**
T_3	70.15	70.12	70.16	70.18	**70.15**
T_4	70.19	70.51	70.44	70.48	**70.41**
T_5	70.17	70.53	70.41	70.44	**70.39**
T_6	70.11	70.14	70.18	70.22	**70.16**
SEm ± (T)	**0.061**	**0.213**	**0.182**	**0.186**	
CD @ 5% (T)	**NS**	**NS**	**NS**	**NS**	
CV %	**0.250**	**0.260**	**0.280**	**0.260**	

(c) Moisture (%). The moisture content (%) of the candy varied significantly up to 4 month of storage. The minimum change in moisture content was noted in candy prepared by using 1 kg syrup (50°Brix) per kg pieces (T_4) (15.26-12.58%) during storage up to six months. However, moisture content was decreased with storage (Table 4). The decline in moisture content might be attributed to evaporation of moisture from the candy. Similar findings are in line with the observations reported by Naik *et al.* (2018) for carrot candy and Tripathi *et al.* (1988); Nayak *et al.* (2012) for aonla candy.

(d) Acidity (%). It is revealed from table 4 that the acidity of candy varied significantly when prepared using different levels of sugar/syrup. Maximum acidity was observed in candy prepared by using 1 kg syrup (60°Brix) per kg pieces (T_5)(0.309%) which is at par with T_4at the end of storage whereas; minimum acidity was noted in candy prepared by using 1 kg syrup (70°Brix) per kg pieces (T_6) (0.299%). However, acidity was gradually decreased with the advancement of storage. There was a tendency that the higher concentration of sugar solution used, lower the acidity and on the contrary the lower the concentration of sugar solution used the higher the acidity and osmotic process which makes water to move out of the food into the solution and leach out the natural solutes (organic acid) from the food into the solution and acidity is ultimately reduced. The similar findings were noted by Hasanuzzaman *et al.,* (2014) in tomato candy and Naik *et al.* (2018) for carrot candy.

Table 4: Effect of different sugar/syrup treatments on moisture (%) and acidity (%) of papaya candy.

	Moisture (%)				Acidity (%)			
Treatment	**0 Months**	**2 Months**	**4 Months**	**6 Months**	**0 Months**	**2 Months**	**4 Months**	**6 Months**
T_1	14.79	13.26	13.59	10.66	0.316	0.313	0.312	0.302
T_2	15.02	13.42	12.80	10.32	0.313	0.313	0.309	0.301
T_3	13.88	12.05	10.69	9.36	0.314	0.310	0.307	0.304
T_4	15.26	13.38	12.08	12.58	0.323	0.319	0.317	0.308
T_5	15.34	14.64	12.26	10.90	0.324	0.321	0.318	0.309
T_6	14.36	12.77	10.87	9.41	0.310	0.309	0.303	0.299
SEm ±	**0.298**	**0.615**	**0.613**	**0.773**	**0.003**	**0.002**	**0.003**	**0.003**
CD @ 5%	**1.085**	**NS**	**2.227**	**NS**	**0.011**	**0.006**	**0.010**	**NS**
CV %	**2.190**	**1.370**	**2.480**	**1.840**	**1.03**	**1.88**	**0.87**	**0.95**

(e) Reducing and total sugars (%). In case of sugars, reducing and total sugars of papaya candy were increased during storage with significantly highest reducing sugars were in candy prepared by using 1 kg syrup (50°Brix) and (60°Brix) per kg pieces (T_4 and T_5, respectively) (41.60%) while, the lowest reducing sugars were in candy prepared by using 1 kg syrup (70°Brix) per kg pieces (T_6) (31.43%). The increase in reducing sugars during storage might be attributed to hydrolysis of non-reducing sugars to reducing sugars (Pawar *et al.,* 2013) for aonla candy and Babariya *et al.,* (2014) for papaya candy. The highest total sugars were noted in candy prepared by using 1 kg syrup (50°Brix) per kg pieces (T_4) (68.96%) and minimum in candy prepared by using 1000 g sugar per kg pieces (T_3) (56.46%). The sugars were increasing during entire storage period of six months. The acid hydrolysis of polysaccharides (including pectin and starch) as well as partial hydrolysis of complex carbohydrates in presence of organic acid leads to increase in total sugars during storage. The increase in sugars during storage in the present investigation are in line with the observations reported by Naik *et al.,* (2018) for carrot candy, Priya and Khatkar (2013) for *aonla* preserve and Phisut *et al.,* (2013) for cantaloupe candy.

Table 5: Effect of different sugar/syrup treatments on reducing sugars (%) and total sugars (%) of papaya candy.

	Reducing Sugars (%)				Total Sugars (%)			
Treatment	**0 Months**	**2 Months**	**4 Months**	**6 Months**	**0 Months**	**2 Months**	**4 Months**	**6 Months**
T_1	32.31	33.27	34.34	35.35	63.35	63.32	65.06	65.87
T_2	32.97	33.63	34.84	35.48	56.34	57.68	59.08	59.97
T_3	27.37	29.07	30.16	32.40	50.48	52.10	52.35	56.46
T_4	36.42	37.87	39.81	41.60	67.07	67.78	68.84	68.96
T_5	36.48	38.17	39.88	41.60	63.65	63.69	64.98	66.12
T_6	28.45	29.92	30.90	31.43	55.76	56.38	57.22	57.85
SEm ±	**1.280**	**1.944**	**2.185**	**2.660**	**2.973**	**3.975**	**3.441**	**4.038**
CD @ 5%	**4.655**	**7.068**	**7.944**	**9.672**	**10.808**	**NS**	**10.453**	**NS**
CV %	**0.830**	**0.860**	**0.930**	**0.980**	**0.350**	**0.34**	**0.33**	**2.03**

(f) Carotene (mg/100 g). The carotene content of papaya candy decreased with the advancement of storage period of six months (table 6). Significantly the highest carotene content was found in candy prepared by using 1 kg syrup (50°Brix) per kg pieces (T_4) (51.35 mg/100g) followed by T_5(48.66 mg/100g) whereas, the lowest in candy prepared by using 1000 g sugar per kg pieces (T_3) (30.26mg/100g). The carotene level of the product was decreased significantly irrespective of the treatment up to the end of the six months of storage. The pattern of decreasing of carotene during storage might be due to oxidative breakdown, isomerization or enzymatic destruction of pigments as well as increasing heating time during processing and increasing temperature at ambient condition during storage. Carotene is also sensitive to heat as same as an ascorbic acid. It was also noticed that the decrease in carotene content during storage may be attributed to its sensitivity to light and oxygen. Similar findings were earlier reported by Naik *et al.* (2018) for carrot candy and Madan and Dhawan (2005) in carrot candies prepared in sugar.

(g) Ascorbic acid (mg/100 g). Effect of treatments and storage on ascorbic acid was found significant. The ascorbic acid content was noted highest in candy prepared by using 1 kg syrup (50°Brix) per kg pieces (T_4) (15.28 mg/100g) up to six months of storage while, the lowest in candy prepared by using 1000 g sugar per kg pieces (T_3) (11.76 mg/100g). Ascorbic acid content decreased with the advancement of storage period which may be due to leaching and degradation of ascorbic acid probably due todecrease in oxygen solubility in syrups(Castagnini *et al*., 2015). It was also observed that ascorbic acid content decreases with increasing processing time, osmotic concentration and temperature. Similar results were observed by Naik *et al.,* (2018) for carrot candy and Devic*et al*. (2010)for osmo dehydrated apples. Loss in ascorbic acid content was also observed by Rani and Bhatia (1985) in pear candy and Kumar and Singh (2001) in aonla products.

Table 6: Effect of different sugar/syrup treatments on carotene (mg/100g) and ascorbic acid (mg/100g) of papaya candy.

Carotene (mg/100g)					Ascorbic acid (mg/100g)			
Treatment	**0 Months**	**2 Months**	**4 Months**	**6 Months**	**0 Months**	**2 Months**	**4 Months**	**6 Months**
T_1	55.16	53.81	48.19	46.48	17.60	16.39	15.38	14.25
T_2	52.59	47.07	41.06	39.24	17.43	16.27	15.39	13.78
T_3	39.21	38.40	33.89	30.26	17.14	14.67	13.36	11.76
T_4	59.76	58.78	52.52	51.35	18.71	17.39	16.89	15.28
T_5	58.21	56.22	51.83	48.66	18.49	16.96	16.42	15.05
T_6	46.86	45.88	39.96	34.84	16.85	15.46	14.22	12.32
SEm ±	**1.695**	**1.252**	**1.909**	**2.643**	**0.172**	**0.426**	**0.512**	**0.495**
CD @ 5%	**6.164**	**4.552**	**6.942**	**9.609**	**0.626**	**1.549**	**1.860**	**1.806**
CV %	**0.36**	**0.49**	**0.42**	**0.45**	**1.010**	**1.110**	**1.720**	**1.290**

(h) Sensory evaluation. Data presented in Tables 7 to 9 show the sensory score for papaya candy up to six months storage. The colour, texture, flavour, taste and overall acceptability of ripe papaya candy were observed to be significantly affected by treatments. From the tables it can be revealed that highest score for all the sensory parameters were noted in candy prepared by using 1 kg syrup (50°Brix) per kg pieces (T_4) (7.53, 7.90, 7.55, 7.81 and 7.70 for colour, texture, flavour, taste and overall acceptability, respectively) might be due to slow osmosis which is at par with T_5 whereas, lowest in candy prepared by using 1 kg syrup (70°Brix) per kg pieces (T_6) which is at par with T_3. Furthermore, the score of overall acceptability was decreasing with storage up to 6 months at ambient temperature condition. It could be due to correlated to change in colour, texture, taste and flavour of carrot candy during storage. However, under room condition the quality was maintained to more than six months of storage (Naik *et al.,* 2019,; Nayak *et al.,* 2012; Pawar *et al.,* 2013; Mishra *et al.,* 2013).

Table 7: Effect of different sugar/syrup treatments on colour and texture (9 point Hedonic scale) of papaya candy.

Colour (9 point Hedonic scale)					Texture (9 point Hedonic scale)			
Treatment	**0 Months**	**2 Months**	**4 Months**	**6 Months**	**0 Months**	**2 Months**	**4 Months**	**6 Months**
T_1	7.28	7.56	7.17	7.00	7.97	7.91	7.56	7.35
T_2	7.50	6.94	6.74	6.47	7.78	7.46	7.42	7.08
T_3	6.67	6.51	6.24	6.18	6.83	6.68	6.21	6.13
T_4	8.04	7.93	7.59	7.53	8.33	8.21	8.05	7.90
T_5	8.10	7.76	7.55	7.51	8.18	8.09	7.97	7.73
T_6	6.65	6.40	6.18	6.12	6.95	6.71	6.44	6.12
SEm ±	**0.313**	**0.284**	**0.303**	**0.245**	**0.226**	**0.191**	**0.115**	**0.102**
CD @ 5%	**1.138**	**1.031**	**1.101**	**0.890**	**0.823**	**0.694**	**0.330**	**0.293**
CV %	**4.410**	**4.530**	**4.330**	**3.950**	**3.960**	**3.610**	**4.470**	**4.100**

Table 8: Effect of different sugar/syrup treatments on flavour and taste (9 point Hedonic scale) of papaya candy.

Flavour (9 point Hedonic scale)					Taste (9 point Hedonic scale)			
Treatment	**0 Months**	**2 Months**	**4 Months**	**6 Months**	**0 Months**	**2 Months**	**4 Months**	**6 Months**
T_1	7.20	7.14	6.65	6.83	8.01	7.79	6.95	7.28
T_2	6.62	6.55	6.73	6.42	7.31	7.01	7.05	6.37
T_3	6.37	6.27	6.18	6.14	6.85	6.25	6.20	6.15
T_4	7.99	7.78	7.63	7.55	8.47	8.31	8.18	7.81
T_5	7.92	7.70	7.62	7.36	8.45	8.20	8.09	7.65
T_6	6.23	6.22	6.18	6.14	6.93	6.32	6.18	6.14
SEm ±	**0.103**	**0.155**	**0.267**	**0.257**	**0.121**	**0.221**	**0.259**	**0.102**
CD @ 5%	**0.296**	**0.563**	**0.972**	**0.935**	**0.347**	**0.802**	**0.941**	**0.293**
CV %	**4.130**	**3.870**	**3.930**	**4.290**	**4.460**	**4.200**	**3.920**	**4.190**

Table 9: Effect of different sugar/syrup treatments on overall acceptability (9 point Hedonic scale) of papaya candy.

Treatment	Overall acceptability (9 point Hedonic scale)			
	0 Months	2 Months	4 Months	6 Months
T_1	7.61	7.60	7.08	7.11
T_2	7.30	6.99	6.98	6.58
T_3	6.68	6.43	6.20	6.15
T_4	8.20	8.05	7.86	7.70
T_5	8.16	7.94	7.81	7.56
T_6	6.69	6.41	6.24	6.13
SEm ±	**0.146**	**0.151**	**0.160**	**0.169**
CD @ 5%	**0.532**	**0.549**	**0.581**	**0.614**
CV %	**2.960**	**2.680**	**2.650**	**3.000**

CONCLUSION

It is concluded that ripe papaya fruits can be utilized for the preparation of candy to increase the acceptability. The papaya candy prepared by different sugar/syrup treatments showed remarkable changes in nutritional as well as sensory qualities. The TSS, total and reducing sugars were gradually increased during storage period while, acidity, moisture, carotene and ascorbic acid were decreased. The organoleptic characteristics such as colour, texture, flavour, taste and overall acceptability decreased slightly with advancement of storage period. Likewise, throughout the storage period, papaya candy was completely free from microbial spoilage. The candy prepared by mixing of 1 kg syrup (50^o B) per kg pieces followed by increase of 10^oB everyday by adding sugar into syrup up to 70^o B was found superior based on nutritional quality with higher recovery compared to other treatments. After osmotic treatment, the candy rinsed with warm water quickly and dried at 60^oC temperature. The papaya candy packed in polypropylene bags (400 gauges) can be successfully stored at ambient temperature for a period of six months remained shelf stable and found more acceptable on the basis of sensory scores and higher retention of physico-chemical compositions.

FUTURE SCOPE

Now-a-days peoples are conscious towards the novel products from fruits for the better health as well variety of foods. It can be prepared by using ripe papaya along with 1 kg syrup (50^o B) per kg pieces. It significantly increase the stability of the product up to six month at ambient storage condition. Ripe papaya candy can be easily prepare, store and easy to transport and also can be used as a snack substitute. In coming days ripe papaya candy can be used as nutraceutical food to eliminate vitamin A deficiency, ability to cure irritable bowel syndrome such as constipation and also enhance growth of beneficial bacteria cells in colon.

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Conflict of Interest. None.

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