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Effect of Foaming Agent and Anti-caking Agent Concentration on Moisture Content, Water Activity and Overall Acceptability of Sapota Fruit Powder

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ABSTRACT: The experiment was conducted to developed a methodology standardize the process for foam mat drying of sapota pulp for preparation of free flowing powder and to study the storage stability of the developed products. Dehydration of sapota pulp of ripe fruits is also difficult due to presence of soluble sugar. Cabinet tray drying can be used for dehydration of sapota pulp but foam mat drying is an economical alternative to drum, spray and freeze-drying for the production of fruit powders. The foam mat drying of sapota pulp was done using sixteen treatments combinations comprised of four level of foaming agent [Control @ 0.00 % (F_1), Medium viscous CMC @ 0.50% (F_2), Medium viscous CMC @ 1.00% (F_3), Medium viscous CMC @ 1.50% (F_4) and four level of anti-caking agent [Control @ 0.00 % (A_1), SiO_2 @ 0.50 % (A_2), SiO_2 @ 1.00 % (A_3) and SiO_2 @ 1.50 % (A_4)]. The results of investigation indicated that sapota pulp powder can be prepared by foaming agent 1.50 per cent medium viscous CMC by mechanical dehydration in cabinet dryer till a moisture content of 6-7 per cent and packed with incorporation 1.50 per cent anti-caking agent remains shelf stable on the basis of minimum moisture content, water activity and sensory quality upto six months storage. The cost of production per 200 ml bottle of sapota juice worked out Rs. 94.37, while the cost of production per 50 g pack of sapota powder worked out Rs. 16.03. Thus, prepared powder can commercially be explored by food processing industry to ensure better returns to growers, processors and consumers as well.

Keywords: Foaming agent, anti-caking agent, moisture content, water activity, powder, Overall acceptability.

INTRODUCTION

Sapota (*Manilkara achras* (Mill) Fosberg) belongs to family sapotaceae and is a popular tropical fruit commercially grown in India. Sapota is native of Tropical America and probably originated from southern Mexico or Central America. In South Mexico, Guatemala and other countries, it is commercially grown for the production of chickle which is a gum like substance obtained from the latex and is mainly used for the preparation of chewing gum. However, in India, it is cultivated extensively for table purpose owing to its fruit value. Among the tropical fruits, sapota is the fifth popular fruit crop in both production and consumption next to mango, banana, citrus and grape. Sapota is mainly grown in India, Philippines, Malaysia, Indonesia, Florida, Guatemala, Mexico and Sri Lanka. India is the largest producer of sapota in the world and cultivated under 0.10 million hectare area with the production of 1.22 million MT and 9.9 MT/ha productivity (Anon., 2020). According to Chadha (1992), sapota was first introduced in Gholwad village in Maharashtra during the year 1898, from where it has been spread to other parts of the country. It is commercially grown in India in the states Maharashtra, Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Uttar Pradesh, West Bengal, Punjab, Haryana and some humid part of Rajasthan. In Gujarat, the area under sapota cultivation is 27.83 thousand ha with production of 3.1 lakh tones and productivity of 11.06 MT/ha. While in south Gujarat, the area under sapota cultivation is 13.03 thousand ha with 1.58 lakh tones of annual production wherein its cultivation is concentrated mainly in Navsari, Valsad and Surat districts (Anon., 2019-20). In India, Gujarat possess second rank in both area and production after Karnataka. Sapota fruit is known for its sweet delicious taste and possesses a delicate characteristic aroma when

fully ripe. The fruit is a good source of digestible sugar (12 to 18 %) and appreciable source of protein, fat, fiber and minerals like calcium, phosphorous and iron (Chadha, 2001). Among the 41 varieties grown all over India, Kalipatti is an outstanding variety of sapota and popularly cultivated in Gujarat due to its excellent taste and aroma, soft and mellow flesh with less number of seeds, high productivity, continuous fruiting throughout the year, very little incidence of insect-pest and diseases and free from physiological disorders which otherwise very common in other major fruits like mango, citrus, etc. It is well known fact that in Gujarat, this crop has played a significant role in socio-economic upliftment of both marginal and big farmers. Being an assured and regularly paying crop, and better marketing facilities provided by co-operative societies; farmers from South Gujarat tend to grow sapota for commercial fruit production.

Dehydration of sapota pulp of ripe fruits is also difficult due to presence of soluble sugar. Cabinet tray drying can be used for dehydration of sapota pulp but foam mat drying is an economical alternative to drum, spray and freeze-drying for the production of fruit powders. In this method, the pulp is whipped to form stable foam, and dehydrated by thermal means. The larger surface area of the foam accelerated the drying process for the rapid moisture removal from the high moisture food. A high-quality fruit powder can be obtained by the proper selection of foaming method, foaming agents, foam stabilizers, time taken for foaming, suitable drying method and temperature (Sangamithra *et al*., 2014)

MATERIALS AND METHODS

Experiment was carried out in Centre of Excellence on Post Harvest Technology, Department of Post Harvest Technology, ASPEE College of Horticulture and Forestry, N.A.U., Navsari. Selected ripe sapota fruits were washed with tap water to remove the adhering dirt and dust particles. After washing, fruits were peeled followed by seed separation and extraction of sapota pulp. The sapota pulp was used to dry in cabinet dryer after foaming with different concentration of foaming agent medium viscous CMC (Factor 1) followed by preparation of sapota powder by grinding. After grinding, anti-caking agent SiO_2 (Factor 2) viz. medium viscous CMC was added (as per treatment) into sapota powder (Fig. 1).

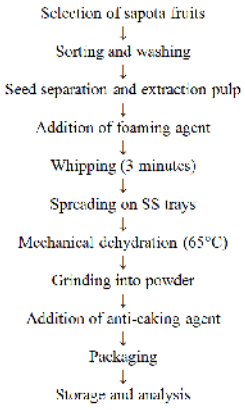

Fig. 1. Principal steps used for preparation of sapota fruit powder.

RESULTS AND DISCUSSION

Moisture. Perusal of data pertaining to effect of foaming agent on moisture content of foam mat dehydrated sapota pulp powder along with anti-caking agent treatments during six months storage has been presented in Table 1 and Fig. 2.

Effect of foaming agent: Data shows that among different foaming agent (CMC) treatments, the mean moisture content of foam mat dehydrated sapota pulp powder (F) varied significantly from 5.31 to 5.58 per cent, with minimum moisture content in sapota pulp dehydrated by using 1.50 per cent medium viscosity CMC (F_4) and maximum moisture in sapota pulp dehydrated without foaming agent F_1 (control). Variation in moisture content might be due to higher drying rate with lesser drying time as compared to control. Similar significant variations due to use of foaming agent on moisture content were also reported by Mishra *et al.,* (2002) for foam mat drying of apple and Rajkumar *et al.,* (2007) for foam mat drying of alphonso mango pulp.

Effect of anti-caking agents: It was observed that mean moisture content of sapota powder (A) containing different concentration of anti-caking agents (SiO_2) varied from 5.28 to 5.61 per cent, with minimum moisture content in sapota powder containing 1.50 per cent anti-caking agent (A_4) and maximum moisture content in sapota powder without anti-caking agent (A_1). Lee *et al*., (2018) reported that lower moisture content were recorded for soursop powder with anti-caking agent. Roustapour *et al*., (2006) reported that lower moisture content in lime fruits powder using 10 % silicon dioxide and 20 % maltodextrin.

Effect of storage: Data depicts that storage of dehydrated sapota pulp powder resulted significant increase in mean moisture content (S) from 4.73 to 6.29 per cent during six months. Sharada (2013) also reported gradual increase in moisture content of foam mat dried guava and banana powder during storage. It may be due to absorption of moisture during storage which might be attributed to permeability of the packaging material toward moisture absorption. The similar reason for other processed products had been reported by Raj *et al.,* (2009) for dehydrated onion rings, Vaghasiya (2018) for dehydrated *Aloe vera* jel and Ajela *et al.,* (2008) for dietary powder of mango peel.

Effect of interactions: Interaction of foaming agent and anti-caking agent treatment depicted variation in moisture content from 5.10 to 5.69 per cent, with minimum moisture content (5.10 %) in sapota pulp powder prepared using 1.50 per cent foaming agent contain 1.50 per cent anti-caking agent (F_4A_4) and maximum moisture content (5.69 %) in sapota pulp powder prepared without using foaming agent and anti-caking agent (F_1A_1). Interaction of foaming agent and storage (FS) depicted significant variation in moisture from 4.66 to 6.55 per cent during six months storage, with minimum increase from 4.66 to 6.12 per cent in sapota pulp powder prepared by using 1.50 per cent medium viscous CMC (F_4S_1 to F_4S_3) and maximum increase from 4.83 to 6.55 per cent in sapota powder

prepared by without using medium viscous CMC (F_1S_1 to F_1S_3). Interaction of anti-caking agent and storage (AS) depicted variation in moisture content from 4.65 to 6.59 per cent, with minimum increase in moisture content from 4.65 to 6.06 per cent in sapota pulp powder containing 1.50 per cent anti-caking agent (A_4S_1 to A_4S_3) and maximum increase in moisture content from 4.84 to 6.59 per cent in sapota pulp powder without anti-caking agent (A_1S_1 to A_1S_3).

Table 1: Effect of foaming agent and anti-caking agent concentration on moisture content of sapota powder during storage.

Storage (S)	Anti-caking agents (A)	Moisture content (%)					
		Foaming agent (F)				Mean (AS) (S)	Mean (A)
		F_1 : 0.00 %	F_2 : 0.50 %	F_3 : 1.00 %	F_4 : 1.50 %		
S_1 : Initial	A_1 : 0.00 %	4.89	4.84	4.82	4.81	**4.84**	**5.61**
	A_2 : 0.50 %	4.83	4.75	4.73	4.72	**4.76**	**5.47**
	A_3 : 1.00 %	4.80	4.69	4.64	4.58	**4.68**	**5.33**
	A_4 : 1.50 %	4.78	4.66	4.60	4.54	**4.65**	**5.28**
	Mean (FS)	**4.83**	**4.74**	**4.70**	**4.66**	**4.73**	
S_2 : 3 month	A_1 : 0.00 %	5.46	5.41	5.36	5.35	**5.40**	
	A_2 : 0.50 %	5.39	5.28	5.26	5.23	**5.29**	
	A_3 : 1.00 %	5.33	5.19	5.12	5.04	**5.17**	
	A_4 : 1.50 %	5.30	5.15	5.06	4.98	**5.12**	
	Mean (FS)	**5.37**	**5.26**	**5.20**	**5.15**	**5.24**	
S_3 : 6 month	A_1 : 0.00 %	6.72	6.60	6.53	6.51	**6.59**	
	A_2 : 0.50 %	6.55	6.35	6.32	6.28	**6.38**	
	A_3 : 1.00 %	6.49	6.18	6.03	5.90	**6.15**	
	A_4 : 1.50 %	6.43	6.11	5.93	5.78	**6.06**	
	Mean (FS)	**6.55**	**6.31**	**6.20**	**6.12**	**6.29**	
	Mean (F)	**5.58**	**5.43**	**5.37**	**5.31**		
F×A	A_1 : 0.00 %	5.69	5.62	5.57	5.56		
	A_2 : 0.50 %	5.59	5.46	5.44	5.41		
	A_3 : 1.00 %	5.54	5.35	5.26	5.17		
	A_4 : 1.50 %	5.50	5.31	5.20	5.10		
S.Em.±	F	A	F×A	S	F×S	A×S	F×A×S
	0.037	0.037	0.075	0.033	0.067	0.067	0.135
$CD_{0.05}$	0.108	0.108	NS	0.095	NS	NS	NS
CV %	**4.18**			**4.33**			

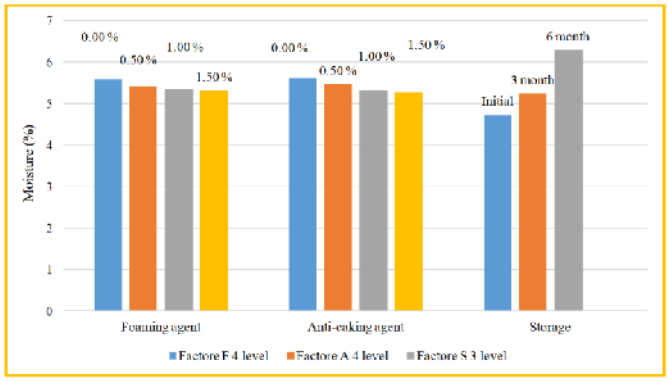

Fig. 2. Effect of foaming agent and anti-caking agent concentration on moisture content of sapota powder during storage.

Further, interaction of foaming agent, anti-caking agent and storage depicted variation in moisture content in sapota pulp powder during six month storage, with minimum increase in moisture content from 4.54 to 5.78 per cent in sapota pulp powder prepared using 1.50 per cent foaming agent contain 1.50 per cent anti-caking agent ($F_4A_4S_1$ to $F_4A_4S_3$) and maximum increase in moisture content 4.89 to 6.72 per cent in sapota pulp powder prepared without using foaming agent and anti-caking agent ($F_1A_1S_1$ to $F_1A_1S_3$). However, the all interactions were found to have non-significant effect. The increase in moisture content during storage it may be due to absorption of moisture during storage which might be attributed to permeability of the packaging material toward moisture absorption. The similar reason for other processed products had been reported by Raj *et al.*, (2009) for dehydrated onion rings, Vaghasiya (2018) for dehydrated *Aloe vera* jel and Ajela *et al.*, (2008) for dietary powder of mango peel. Sharada (2013) also reported gradual increase in moisture content of foam mat dried guava and banana powder during storage.

Water activity. Perusal of data pertaining to effect of foaming agent on water activity of foam mat dehydrated sapota pulp powder along with anti-caking agent treatment during six months storage has been presented in Table 2 and Fig. 3.

Effect of foaming agent: Data shows that among different foaming agent (CMC) treatments, the mean water activity of foam mat dehydrated sapota pulp powder (F) varied significantly from 0.590 and 0.605, with minimum water activity in sapota pulp powder prepared by using 1.50 per cent medium viscous CMC (F_4) and maximum water activity in sapota pulp powder dehydrated without using foaming agent (F_1). It may be due to absorption of moisture during storage which might be attributed to permeability of the packaging material toward moisture absorption. The similar reason for other processed products had been reported by Raj *et al*. (2009) for dehydrated onion rings. Ramachandra and Rao (2011) also reported gradual increase in water activity of dehumidified air dried Aloe vera gel powder during accelerated storage.

Table 2: Effect of foaming agent and anti-caking agent concentration on water activity of sapota powder during storage.

Storage (S)	Anti-caking agents (A)	Water activity (a_w)					
		Foaming agent (F)				Mean (AS) (S)	Mean (A)
		F_1 : 0.00 %	F_2 : 0.50 %	F_3 : 1.00 %	F_4 : 1.50 %		
S_1 : Initial	A_1 : 0.00 %	0.520	0.516	0.515	0.514	**0.516**	**0.607**
	A_2 : 0.50 %	0.515	0.509	0.507	0.506	**0.509**	**0.599**
	A_3 : 1.00 %	0.512	0.503	0.498	0.493	**0.502**	**0.591**
	A_4 : 1.50 %	0.510	0.500	0.495	0.490	**0.499**	**0.588**
	Mean (FS)	**0.515**	**0.507**	**0.504**	**0.501**	0.507	
S_2 : 3 Month	A_1 : 0.00 %	0.631	0.627	0.625	0.624	**0.627**	
	A_2 : 0.50 %	0.626	0.619	0.617	0.616	**0.620**	
	A_3 : 1.00 %	0.622	0.613	0.608	0.603	**0.611**	
	A_4 : 1.50 %	0.620	0.610	0.604	0.598	**0.608**	
	Mean (FS)	**0.625**	**0.617**	**0.614**	**0.610**	0.616	
S_3 : 6 Month	A_1 : 0.00 %	0.681	0.677	0.675	0.674	**0.677**	
	A_2 : 0.50 %	0.676	0.669	0.667	0.666	**0.670**	
	A_3 : 1.00 %	0.672	0.662	0.658	0.652	**0.661**	
	A_4 : 1.50 %	0.671	0.660	0.654	0.648	**0.658**	
	Mean (FS)	**0.675**	**0.667**	**0.664**	**0.660**	0.666	
	Mean (F)	**0.605**	**0.597**	**0.594**	**0.590**		
F×A	A_1 : 0.00 %	0.611	0.607	0.605	0.604		
	A_2 : 0.50 %	0.606	0.599	0.597	0.596		
	A_3 : 1.00 %	0.602	0.593	0.588	0.583		
	A_4 : 1.50 %	0.600	0.590	0.584	0.579		
S.Em.±	F	A	F×A	S	F×S	A×S	F×A×S
	0.0035	0.0035	0.0070	0.0031	0.0062	0.0062	0.0125
$CD_{0.05}$	NS	NS	NS	0.0088	NS	NS	NS
CV %	3.51			3.63			

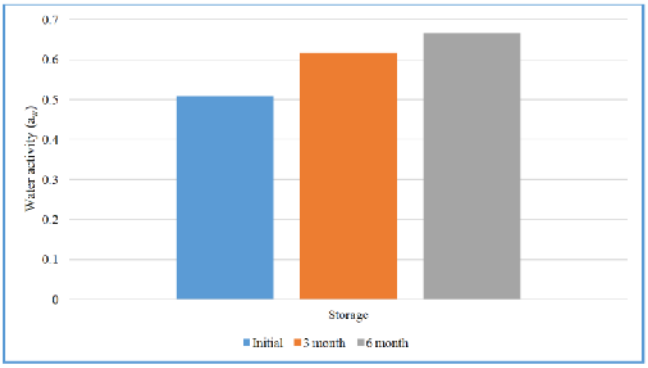

Fig. 3. Effect of foaming agent and anti-caking agent concentration on water activity of sapota powder during storage.

Effect of anti-caking agent: It was observes that mean water activity of sapota powder (A) containing different concentration of anti-caking agents (SiO_2) varied significantly from 0.588 to 0.607, with minimum water activity in sapota powder containing 1.50 per cent anti-caking agent (A_4) and maximum water activity in sapota powder without anti-caking agent (A_1). It may be due to absorption of moisture during storage which

might be attributed to permeability of the packaging material toward moisture absorption. Lee *et al*., (2018) reported that lower water activity were recorded for soursop powder with anti-caking agent.

Effect of storage: Data depicts that storage of dehydrated sapota pulp powder resulted significant increase in mean water activity (S) from 0.507 to 0.666 during six months. It may be due to absorption of moisture during storage which might be attributed to permeability of the packaging material toward moisture absorption. The similar reason for other processed products had been reported by Raj *et al.,* (2009) for dehydrated onion rings, Vaghasiya (2018) for dehydrated *Aloe vera* jel and Ajela *et al.,* (2008) for dietary powder of mango peel.

Effect of interactions: Interaction of foaming agent and anti-caking agent treatment depicted variation in water activity from 0.579 to 0.611, with minimum water activity (0.579) in sapota pulp powder prepared using 1.50 per cent foaming agent contain 1.50 per cent anti-caking agent (F_4A_4) and maximum water activity (0.611) in sapota pulp powder prepared without using foaming agent and anti-caking agent (F_1A_1). Interaction of foaming agent and storage (FS) depicted significant variation in water activity from 0.501 to 0.675 during six months storage, with minimum increase from 0.501 to 0.660 in sapota pulp powder prepared by using 1.50 per cent medium viscous CMC (F_4S_1 to F_4S_3) and maximum increase from 0.515 to 0.675 in sapota powder prepared by without using medium viscous CMC (F_1S_1 to F_1S_3). Interaction of anti- caking agent and storage (AS) depicted variation in water activity from 0.499 to 0.677, with minimum increase in water activity from 0.499 to 0.658 in sapota pulp powder containing 1.50 per cent anti-caking agent (A_4S_1 to A_4S_3) and maximum increase in water activity from 0.516 to 0.677 in sapota pulp powder without anti-caking agent (A_1S_1 to A_1S_3). Further, interaction of foaming agent, anti-caking agent and storage depicted variation in water activity in sapota pulp powder during six month storage, with minimum increase in water activity from 0.490 to 0.648 ($F_4A_4S_1$ to $F_4A_4S_3$) in sapota pulp powder prepared using 1.50 per cent foaming agent contain 1.50 per cent anti-caking agent and maximum increase in water activity 0.520 to 0.681 in sapota pulp powder prepared without using foaming agent and anti-caking agent ($F_1A_1S_1$ to $F_1A_1S_3$). However, the all interactions were found to have non-significant effect. The increase in water activity during storage it may be due to absorption of moisture during storage which might be attributed to permeability of the packaging material toward moisture absorption. The similar reason for other processed products had been reported by Raj *et al.,* (2009) for dehydrated onion rings, Vaghasiya (2018) for dehydrated *Aloe vera* jel and Ajela *et al.,* (2008) for dietary powder of mango peel. Sharada, (2013) also reported gradual increase in moisture content of foam mat dried guava and banana powder during storage.

Overall acceptability. Perusal of data pertaining to effect of foaming agent on overall acceptability score of foam mat dehydrated sapota pulp powder along with anti-caking agent treatments during six months storage has been presented in Table 3 and Fig. 4.

Effect of foaming agent: Data shows that foaming agent (CMC) treatments, the mean overall acceptability score of foam mat dehydrated sapota pulp powder (F) varied non-significantly from 7.16 to 7.23, with maximum overall acceptability score in sapota pulp dehydrated by using 1.50 per cent medium viscous CMC (F_8) and minimum overall acceptability score in sapota pulp dehydrated without foaming agent (F_1). Similar observation were made by Kandasamy *et al*. (2012) found non-significant effect for various treatments of foam mat drying on overall acceptability.

Effect of anti-caking agent: It was observed that mean overall acceptability score of sapota powder (A) containing different concentration of anti-caking agents (SiO_2) varied from 7.14 to 7.24, with maximum overall acceptability score in sapota powder containing 1.00 per cent anti-caking agent (A_3) and minimum overall acceptability score in sapota powder without anti-caking agent (A_1). Similar observation were made by Kandasamy *et al*., (2012) found non-significant effect for various treatments of foam mat drying on overall acceptability.

Effect of storage: Data depicted that storage of dehydrated sapota pulp powder resulted significant decrease in mean overall acceptability score (S) from 7.45 to 6.91 during six months. The decrease in overall acceptability score might be attributed to increase in moisture content, water activity and NEB in dehydrated sapota powder during storage. Similar observation were made by Kandasamy *et al*., (2012) found non-significant effect for various treatments of foam mat drying on overall acceptability.

Effect of interactions: Interaction of foaming agent and anti-caking agent treatment depicted variation in overall acceptability score from 7.11 to 7.27, with minimum overall acceptability score (7.11) in sapota pulp powder prepared without foaming agent and anti-caking agent (F_1A_1) And maximum overall acceptability score (7.27) in sapota pulp powder prepared using 1.50 per cent foaming agent contain 1.00 per cent anti-caking agent (F_4A_3). The interaction of foaming agent treatment and storage (FS) depicted variation in overall acceptability score from 6.88 to 7.49 during six months storage, with minimum decrease in overall acceptability from 7.49 to 6.94 in sapota powder prepared by using 1.50 per cent medium viscous CMC (F_4S_1 to F_4S_3) and maximum decrease in overall acceptability from 7.40 to 6.88 in sapota powder prepared by without using CMC (F_1S_1 to F_1S_3). Interaction of anti-caking agent and storage (AS) depicted variation in overall acceptability score from 7.50 to 6.86 during six month storage, with maximum decrease in overall acceptability score from 7.38 to 6.86 in sapota powder without using anti-caking agent and minimum decrease in overall acceptability score from 7.50 to 6.95 in sapota powder containing 1.00 per cent anti-caking agent. Further, interaction of foaming agent, anti-caking agent and storage depicted variation in overall acceptability score in sapota pulp powder during six month of storage, with minimum decrease in overall

acceptability score from 7.54 to 6.97 ($F_4A_3S_1$ to $F_4A_3S_3$) in sapota powder prepared using 1.50 per cent foaming agent contain 1.00 per cent anti-caking agent and maximum decrease in overall acceptability score from 7.34 to 6.84 ($F_1A_1S_1$ to $F_1A_1S_3$) in sapota powder without using foaming agent and anti-caking agent. However, the all interactions were found to have non-significant effect.

Table 3: Effect of foaming agent and anti-caking agent concentration on sensory overall acceptability of sapota powder during storage.

Storage (S)	Anti-caking agents (A)	Overall acceptability (9-point Hedonic scale)					
		Foaming agent (F)				Mean (AS) (S)	Mean (A)
		F_1 : 0.00 %	F_2 : 0.50 %	F_3 : 1.00 %	F_4 : 1.50 %		
S_1 : Initial	A_1 : 0.00 %	7.34	7.37	7.40	7.41	**7.38**	**7.14**
	A_2 : 0.50 %	7.37	7.46	7.47	7.48	**7.44**	**7.20**
	A_3 : 1.00 %	7.45	7.50	7.51	7.54	**7.50**	**7.24**
	A_4 : 1.50 %	7.43	7.49	7.50	7.52	**7.49**	**7.23**
	Mean (FS)	**7.40**	**7.45**	**7.47**	**7.49**	**7.45**	
S_2 : 3 month	A_1 : 0.00 %	7.15	7.18	7.20	7.21	**7.18**	
	A_2 : 0.50 %	7.18	7.25	7.25	7.26	**7.23**	
	A_3 : 1.00 %	7.24	7.27	7.28	7.30	**7.27**	
	A_4 : 1.50 %	7.22	7.27	7.28	7.29	**7.26**	
	Mean (FS)	**7.20**	**7.24**	**7.25**	**7.26**	**7.24**	
S_3 : 6 month	A_1 : 0.00 %	6.84	6.86	6.87	6.89	**6.86**	
	A_2 : 0.50 %	6.86	6.92	6.92	6.93	**6.91**	
	A_3 : 1.00 %	6.91	6.95	6.95	6.97	**6.95**	
	A_4 : 1.50 %	6.90	6.94	6.95	6.96	**6.94**	
	Mean (FS)	**6.88**	**6.92**	**6.93**	**6.94**	**6.91**	
	Mean (F)	**7.16**	**7.20**	**7.22**	**7.23**		
F×A	A_1 : 0.00 %	7.11	7.13	7.16	7.17		
	A_2 : 0.50 %	7.14	7.21	7.21	7.22		
	A_3 : 1.00 %	7.20	7.24	7.25	7.27		
	A_4 : 1.50 %	7.18	7.24	7.24	7.26		
S.Em.±	F	A	F×A	S	F×S	A×S	F×A×S
	0.023	0.023	0.046	0.022	0.044	0.044	0.089
$CD_{0.05}$	NS	NS	NS	0.063	NS	NS	NS
CV %	**1.95**			**2.15**			

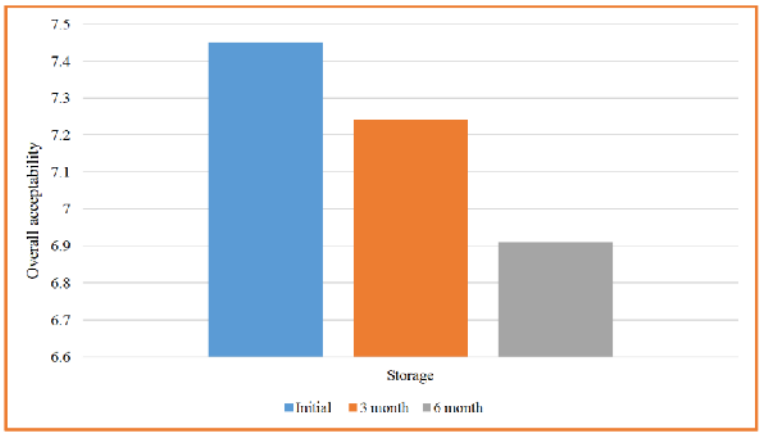

Fig. 4. Effect of foaming agent and anti-caking agent concentration on sensory overall acceptability of sapota powder during storage.

CONCLUSION

The findings summarized above indicate that during six month storage, sapota powder dehydrated by using 1.50 per cent medium viscous CMC (F_4) for foam mat dehydration and packed with incorporation of 1.50 per cent anti-caking agent (A_4) observed to have minimum increase in moisture content and water activity upto six months storage. The sapota pulp powder dehydrated by using 1.50 per cent medium viscous CMC (F_4) for foam mat dehydration and packed with incorporation 1.50 per cent anti-caking agent found superior based on stability of sensory quality during six months storage. The sapota pulp powder prepared by using 1.50 per cent medium viscous CMC followed by mechanical dehydration in cabinet dryer till a moisture content of 6-7 per cent incorporated with 1.50 per cent anti-caking agent (F_4A_4) remained shelf stable on the basis of sensory quality upto six months in polypropylene bag of 400 gauge.

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Conflict of Interest. None.

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