

Supplementray Table 1: ANOVA and regression coefficients of the second-order polynomial model for the response variables

Variables	DF	Water activity	TSS ^o Brix	L	a*	b*	Hardness (N)	TPC (mg GAE/100g)	TFC (mgQE/100g)	DPPH (%)	RPA (µg AAE/100g)	FRAP (µmol/100g)	HRSA (%)	ABTS (%)	Antidiabetic activity (%)	Overall acceptability
Models	9	3.24	26.39	5.16	88.64	41.47	14.88	22.62	9.79	6.01	6.14	12.42	5.51	3.93	8.94	6.35
A	1	18.17*	214.02*	0.43	104.81*	13.73*	108.11*	25.00*	9.08*	1.48	0.31	10.50*	4.332E-004	15.86*	11.96*	20.63*
B	1	0.090	2.00	8.00*	325.08*	202.15*	0.077	53.86*	33.99*	28.00*	14.59*	32.09*	8.98*	7.72*	3.85	0.49
C	1	0.024	5.25*	0.059	20.66*	107.70*	0.34	94.90*	32.18*	16.13*	34.43*	55.97*	34.91*	5.24*	3.09	0.53
A2	1	7.78*	14.59*	0.28	2.28	0.046	3.82	1.79	4.97*	3.41	0.65	0.095	0.055	0.22	39.11*	15.79*
B2	1	1.17	0.19	3.08	5.44	12.27*	5.51*	8.71*	1.25	0.48	0.020	0.50	0.19	2.12	18.51*	5.08*
C2	1	3.114E-003	1.13	31.44*	43.86	30.14*	0.62	16.47*	0.063	0.032	1.32	8.48*	5.46*	1.48	10.02*	14.98*
AB	1	0.058	0.43	0.17	11.68*	0.65	0.52	0.018	0.46	0.12	2.02	2.58	0.070	0.013	1.25	0.82
AC	1	0.23	0.079	1.88	196.24*	2.17	0.031	0.87	2.05	1.56	0.071	0.56	0.040	0.027	3.584E-005	3.98
BC	1	0.92	0.71	3.01	82.78*	0.19	14.92*	1.97	4.59	2.56	1.60	0.56	0.097	3.16	2.52	0.30
R ²		0.7546	0.9596	0.8229	0.9876	0.9739	0.9305	0.9532	0.8981	0.8440	0.8467	0.9179	0.8322	0.7795	0.8894	0.8511

* Significant at 5% level

A= Blanching time at linear level, B= Concentration of spice extract at linear level, C= Concentration of tea extract at linear level, A²= Blanching time at quadratic level, B²= Concentration of spice extract at quadratic level, C²= Concentration of tea extract at quadratic level, AB= Interaction between blanching time and Concentration of spice extract, AC= Interaction between blanching time and concentration of tea extract, BC= Interaction between concentration of spice extract and concentration of tea extract.

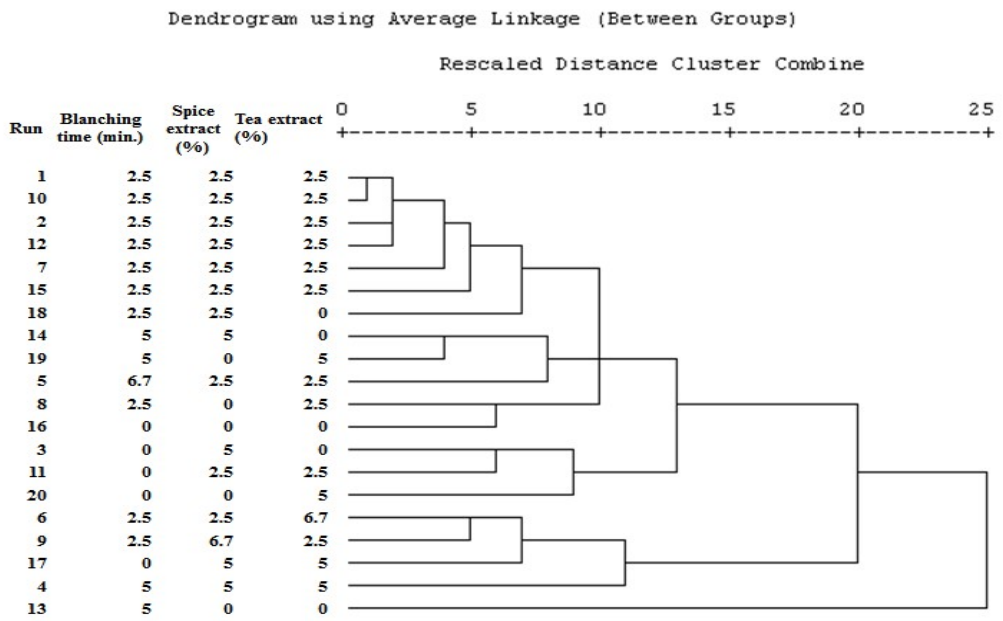
Supplementary **Table 2: Software generated optimized conditions for sand pear cubes (predicted and experimental values for different responses)**

A	B	C		Water activity	TSS	L	a*	b*	Hardness	TPC (mg GAE/100g)	TFC (mgQE/100g)	DPPH (%)	RPA (µg AAE/100g)	FRAP (µmol/100g)	HRSA (%)	ABTS (%)	Antidiabetic activity	Desira
3.53	2.74	2.44	Predicted	0.77	44.42	34.89	1.80	6.55	19.66	160.89	80.91	43.88	144.66	2.59	84.23	83.61	45.48	0.9
			Actual	0.75	43.25	32.99	1.86	6.56	19.32	156.74	78.96	41.56	140.55	2.51	82.86	84.71	46.78	
			Difference	0.02	1.17	1.9	-0.06	-0.01	0.34	4.15	1.95	2.32	4.11	0.08	1.37	-1.1	-1.3	

A= Blanching time (min), B= Concentration of spice extract (%), C= Concentration of tea extract

Supplementary Table 3: FTIR for optimized run and control sample of phytochemical enriched sand pear cubes

Functional compound	Control		Optimized	
	Wave Number	Intensity	Wave number	Intensity
Alkenes, =C–H out-of-plane bending	775.28	0.47858	678.37	0.47359
	816.28	0.41605	730.58	0.35332
β-D-sucrose	864.74	0.38038	864.74	0.48805
β-D-glucose	916.92	0.37823	905.74	0.71122
Alcohol and phenols, C–O stretching.			1047.38	0.80478
			1114.47	0.34110
	1237.47	0.24330	1237.47	0.19173
			1278.47	0.15389
Carbohydrates Coupled stretching and bending	1341.84	0.27804	1364.205	0.19910
NH ₄ ⁺ Si–C6H5 stretching	1420.11	0.26190	1423.84	0.21341
N=N stretching (azocompounds)	1640.02	0.15996		
Carbohydrates, fats C-H stretching	2929.68	0.22270	2937.14	0.16515
O-H stretching	3268.87	0.59638	3321.05	0.43390
			3380.69	0.37795
Phenol O–H stretching			3555.88	0.13074



SupplementaryFig 1: Cluster analysis of different sand pear cubes samples