

Supplementary Tables

Supplementary Table 1 Experimental outputs for the conducted thermosonication trials.

Treatment	PH	TSS	TA	CI	BI	AA	AOA	TAC	TCC	TPC	TFC	TVC	YM
TSSJ-30-30-15	4.02	5.97	3.49	1.102	0.117	40.54	46.04	28.81	113.77	55.47	41.26	4.44	2.94
TSSJ-30-30-30	3.95	5.93	3.57	1.175	0.124	42.65	47.36	30.75	119.34	57.51	43.59	4.32	2.86
TSSJ-30-30-45	3.91	6.00	3.61	1.240	0.152	44.95	48.47	32.62	125.01	59.12	45.80	4.26	2.72
TSSJ-30-30-60	3.87	6.03	3.64	1.293	0.175	47.11	49.80	35.40	133.60	61.41	47.33	4.18	2.64
TSSJ-30-40-15	3.97	6.00	3.55	1.324	0.137	43.36	47.69	30.03	115.25	56.09	42.88	4.35	2.83
TSSJ-30-40-30	3.92	5.97	3.61	1.396	0.158	45.29	48.74	33.66	116.59	58.66	44.87	4.21	2.66
TSSJ-30-40-45	3.83	6.00	3.68	1.437	0.171	47.32	49.19	35.19	118.65	60.66	46.67	4.15	2.52
TSSJ-30-40-60	3.85	6.03	3.73	1.493	0.188	49.16	51.07	36.68	120.59	62.26	48.34	4.07	2.44
TSSJ-30-50-15	3.95	6.00	3.62	1.526	0.149	46.37	58.89	31.90	116.21	57.01	43.57	4.22	2.71
TSSJ-30-50-30	3.88	6.00	3.67	1.585	0.170	48.25	60.35	33.29	118.24	59.68	45.64	4.12	2.58
TSSJ-30-50-45	3.80	6.03	3.72	1.607	0.186	51.10	63.37	32.58	119.65	61.39	47.23	4.04	2.43
TSSJ-30-50-60	3.72	6.07	3.76	1.625	0.194	52.93	64.61	31.29	117.78	63.68	49.76	3.92	2.33
TSSJ-40-30-15	3.72	6.03	3.60	1.446	0.144	43.30	48.55	34.76	115.36	58.54	43.72	4.24	2.73
TSSJ-40-30-30	3.69	5.87	3.63	1.499	0.158	45.46	51.70	39.18	123.89	62.01	45.15	4.03	2.47
TSSJ-40-30-45	3.63	5.90	3.68	1.534	0.177	47.45	53.51	44.28	126.92	66.23	47.67	3.87	2.38
TSSJ-40-30-60	3.59	6.00	3.74	1.583	0.189	49.54	55.39	48.50	129.50	69.57	51.42	3.74	2.02
TSSJ-40-40-15	3.65	5.93	3.65	1.603	0.164	46.69	54.52	35.73	119.21	60.59	44.53	4.15	2.64
TSSJ-40-40-30	3.61	5.97	3.71	1.684	0.175	50.48	56.49	37.41	122.89	64.89	46.10	3.82	2.35
TSSJ-40-40-45	3.56	6.00	3.77	1.747	0.188	54.70	58.19	39.53	125.78	68.96	48.73	3.73	2.07
TSSJ-40-40-60	3.53	5.93	3.81	1.796	0.197	58.74	60.28	43.13	126.61	72.08	53.71	3.60	1.86
TSSJ-40-50-15	3.57	6.00	3.75	1.800	0.172	48.86	57.38	36.48	120.54	62.58	46.66	4.02	2.53
TSSJ-40-50-30	3.50	6.07	3.80	1.825	0.189	52.91	62.46	35.59	117.35	66.83	48.10	3.74	2.21
TSSJ-40-50-45	3.45	6.00	3.85	1.870	0.194	53.62	64.40	35.01	116.73	70.35	51.77	3.56	1.88
TSSJ-40-50-60	3.40	5.90	3.91	1.897	0.197	54.14	66.11	34.29	115.20	74.71	53.83	3.35	1.57
TSSJ-50-30-15	3.67	6.07	3.78	1.738	0.168	46.26	52.16	38.50	117.67	61.79	46.17	4.06	2.30
TSSJ-50-30-30	3.61	5.87	3.86	1.790	0.175	47.52	54.00	40.59	125.37	65.38	49.50	3.76	2.03
TSSJ-50-30-45	3.50	6.03	3.92	1.816	0.184	50.10	56.07	43.26	127.62	69.71	52.56	3.52	1.83
TSSJ-50-30-60	3.42	5.93	3.95	1.885	0.191	55.32	58.18	45.34	130.12	73.85	55.49	3.36	1.55
TSSJ-50-40-15	3.57	6.03	3.84	1.841	0.174	44.87	55.59	37.08	121.39	63.42	47.78	3.84	2.20
TSSJ-50-40-30	3.40	6.07	3.96	1.919	0.183	47.34	57.68	35.93	123.61	67.87	50.40	3.54	1.76
TSSJ-50-40-45	3.37	6.03	4.07	1.975	0.198	52.87	60.27	33.61	126.84	73.72	51.55	3.21	1.44
TSSJ-50-40-60	3.35	5.93	4.11	2.031	0.207	53.07	61.04	32.54	129.66	78.94	54.09	2.89	1.24
TSSJ-50-50-15	3.48	5.97	4.02	1.963	0.181	43.37	58.56	35.15	118.74	66.63	48.97	3.66	2.03
TSSJ-50-50-30	3.36	6.00	4.08	2.041	0.193	45.97	60.70	33.24	115.89	71.28	51.16	3.33	1.54
TSSJ-50-50-45	3.29	6.00	4.14	2.160	0.201	47.29	61.67	31.02	114.70	74.59	52.62	2.93	1.25
TSSJ-50-50-60	3.22	6.00	4.21	2.162	0.210	46.29	62.88	30.26	112.48	76.34	53.78	2.44	1.01

Abbreviations: TSSJ-Thermosonicated sophie juice 30, 40 and 50%, Temperature 30, 40 and 50°C, and Treatment time 15, 30, 45 and 60 min. TSS=total soluble solid; TA= titrable acidity; CI= cloudiness; BI= browning index; AA=ascorbic acid; AOA=antioxidant activity; TAC=total anthocyanin content; TCC=total carotenoid content; TPC= total phenolic content; TFC= total flavonoid content; YM= yeast and mould count.

Supplementary Table 2 Predicted network outputs from ANN modelling.

Treatment	PH	TSS	TA	CI	BI	AA	AOA	TAC	TCC	TPC	TFC	TVC	YM
TSSJ-30-30-15	3.97	5.97	3.52	1.213	0.128	43.76	47.11	34.14	119.65	56.53	42.41	4.39	2.88
TSSJ-30-30-30	3.94	5.97	3.54	1.240	0.138	45.55	47.89	35.29	122.22	57.54	43.48	4.34	2.83
TSSJ-30-30-45	3.90	5.97	3.56	1.272	0.154	47.85	49.15	36.56	124.90	59.33	45.22	4.27	2.74
TSSJ-30-30-60	3.86	5.97	3.59	1.310	0.172	50.41	51.03	37.90	127.35	62.19	47.61	4.14	2.59
TSSJ-30-40-15	3.93	5.99	3.55	1.320	0.137	44.74	49.68	32.14	116.35	57.04	42.87	4.35	2.85
TSSJ-30-40-30	3.89	6.00	3.58	1.365	0.152	46.84	51.78	32.98	118.23	58.46	44.26	4.28	2.77
TSSJ-30-40-45	3.84	6.00	3.62	1.417	0.171	49.33	54.46	33.97	120.59	60.85	46.35	4.16	2.63
TSSJ-30-40-60	3.78	6.00	3.67	1.474	0.187	51.87	57.40	35.11	123.24	64.33	48.91	3.99	2.41
TSSJ-30-50-15	3.88	6.02	3.60	1.487	0.150	45.91	55.40	30.79	114.36	57.76	43.48	4.29	2.79
TSSJ-30-50-30	3.82	6.02	3.64	1.549	0.169	48.27	58.32	31.34	115.44	59.71	45.22	4.19	2.66
TSSJ-30-50-45	3.75	6.02	3.70	1.614	0.186	50.84	60.89	32.02	117.00	62.75	47.61	4.02	2.46
TSSJ-30-50-60	3.68	6.02	3.76	1.678	0.197	53.23	62.84	32.84	119.07	66.70	50.18	3.78	2.18
TSSJ-40-30-15	3.84	5.97	3.60	1.402	0.138	43.87	48.06	36.40	120.73	58.45	43.91	4.28	2.75
TSSJ-40-30-30	3.78	5.97	3.64	1.457	0.154	45.70	49.42	37.74	123.39	60.84	45.86	4.16	2.60
TSSJ-40-30-45	3.70	5.97	3.70	1.518	0.173	48.02	51.41	39.11	126.01	64.32	48.36	3.98	2.36
TSSJ-40-30-60	3.62	5.97	3.76	1.581	0.189	50.59	54.02	40.46	128.28	68.43	50.87	3.73	2.06
TSSJ-40-40-15	3.76	5.99	3.67	1.596	0.152	44.87	52.19	33.85	117.09	59.70	44.79	4.18	2.64
TSSJ-40-40-30	3.68	5.99	3.73	1.661	0.171	47.01	54.94	34.96	119.20	62.74	47.07	4.01	2.42
TSSJ-40-40-45	3.59	5.99	3.80	1.725	0.187	49.52	57.88	36.20	121.72	66.68	49.66	3.77	2.13
TSSJ-40-40-60	3.51	5.99	3.87	1.786	0.198	52.04	60.53	37.53	124.40	70.75	51.94	3.48	1.81
TSSJ-40-50-15	3.65	6.01	3.77	1.800	0.169	46.06	58.78	31.93	114.78	61.33	45.86	4.04	2.47
TSSJ-40-50-30	3.57	6.01	3.84	1.856	0.186	48.45	61.26	32.74	116.05	64.95	48.37	3.81	2.20
TSSJ-40-50-45	3.49	6.01	3.91	1.906	0.197	51.02	63.10	33.69	117.83	69.09	50.87	3.52	1.88
TSSJ-40-50-60	3.42	6.02	3.98	1.951	0.204	53.38	64.32	34.78	120.11	72.79	52.83	3.22	1.57
TSSJ-50-30-15	3.60	5.96	3.77	1.707	0.154	43.98	49.70	38.94	121.86	62.72	46.55	4.00	2.38
TSSJ-50-30-30	3.52	5.96	3.84	1.770	0.173	45.84	51.81	40.30	124.55	66.67	49.12	3.75	2.07
TSSJ-50-30-45	3.44	5.96	3.91	1.828	0.189	48.20	54.49	41.60	127.05	70.73	51.52	3.46	1.75
TSSJ-50-30-60	3.38	5.97	3.98	1.882	0.199	50.77	57.43	42.79	129.11	74.04	53.26	3.16	1.48
TSSJ-50-40-15	3.49	5.99	3.88	1.893	0.171	45.00	55.43	36.05	117.94	64.94	47.82	3.80	2.14
TSSJ-50-40-30	3.42	5.99	3.95	1.939	0.187	47.17	58.35	37.37	120.25	69.07	50.38	3.51	1.82
TSSJ-50-40-45	3.37	5.99	4.01	1.979	0.198	49.70	60.91	38.73	122.88	72.78	52.48	3.21	1.53
TSSJ-50-40-60	3.32	5.99	4.07	2.014	0.204	52.21	62.86	40.10	125.53	75.45	53.87	2.95	1.31
TSSJ-50-50-15	3.41	6.01	3.99	2.020	0.186	46.21	61.61	33.57	115.27	67.33	49.12	3.55	1.89
TSSJ-50-50-30	3.35	6.01	4.04	2.048	0.198	48.63	63.34	34.65	116.76	71.33	51.52	3.25	1.59
TSSJ-50-50-45	3.31	6.01	4.09	2.071	0.204	51.20	64.47	35.85	118.76	74.47	53.26	2.98	1.35
TSSJ-50-50-60	3.28	6.01	4.13	2.089	0.207	53.53	65.17	37.16	121.22	76.51	54.33	2.78	1.20
R ²	0.966	0.870	0.952	0.998	0.988	0.982	0.960	0.821	0.989	0.932	0.980	0.995	0.984
MSE	0.288	0.548	0.288	0.395	0.503	0.203	0.199	0.270	0.199	0.617	0.173	0.304	0.571
MAE	0.001	-0.004	0.007	0.000	0.000	0.101	-0.113	0.029	0.266	0.125	0.033	-0.002	-0.018

Abbreviations: TSSJ=Thermosonicated sophie juice 30, 40 and 50%, Temperature 30, 40 and 50°C, and Treatment time 15, 30, 45 and 60 min. TSS=total soluble solid; TA= titrable acidity; CI= cloudiness; BI= browning index; AA=ascorbic acid; AOA=antioxidant activity; TAC=total anthocyanin content; TCC=total carotenoid content; TPC= total phenolic content; TFC= total flavonoid content; YM= yeast and mould count; R=Coefficient of determination; MSE= mean square error; MAE=mean absolute error.

Supplementary Table 3 List of Abbreviation

1	TA	Titration Acidity	14	R	Coefficient of determination
2	TSS	Total Soluble Solids	15	MSE	Mean square error
3	CI	Cloudiness	16	MAE	Mean absolute error
4	BI	Browning Index	17	TS	Thermosonication
5	AA	Ascorbic Acid	18	PS	Pasteurization
6	AOA	Antioxidant Activity	19	SJ	Sophie Juice
7	TAC	Total Anthocyanin Content	20	RSJ	Raw Sophie juice
8	TCC	Total Carotenoids Content	21	TSSJ	Thermosonicated Sophie Juice
9	TPC	Total Phenolic Content	22	PSSJ	Pasteurized Sophie Juice
10	TFC	Total Flavonoid Content	23	ND	Not Detected
11	TVC	Total Viable Content	24	ANN	Artificial neural network
12	YMC	Yeast and Mould count	25	QE	Quercetin equivalent
13	GAE	Gallic acid equivalents	26	CFU	Colony forming unit
27	ANN	Artificial neural networks	28	GA	Genetic Algorithms