APPENDIXES:

Appendix 1: Time interval specifications for sampling

The '0' day (day 0) analysis were carried out after incubation of yoghurt samples. Subsequently, analyses were carried out after 7, 14, and 21 days of refrigerated storage at 4 ^{o}C.

Appendix 2: Table 4.1: Changes of pH during fermentation of yoghurts at 41^{o}C to final pH 4.5

Hour	AS	CP	IV	LB	MG	PL	PG
0	6.55±0.06^{a}	6.54±0.01^{a}	6.63±0.08^{a}	6.62±0.03^{a}	6.51±0.07^{a}	6.67±0.01^{a}	6.57±0.01^{a}
1	6.65±0.04^{a}	6.65±0.05^{a}	6.73±0.04^{a}	6.71±0.03^{a}	6.61±0.06^{a}	6.64±0.01^{a}	6.67±0.03^{a}
2	6.65±0.03^{a}	6.57±0.07^{a}	6.69±0.03^{a}	6.68±0.03^{a}	6.66±0.03^{a}	6.69±0.01^{a}	6.67±0.01^{a}
3	6.64±0.06^{a}	6.58±0.07^{a}	6.66±0.02^{a}	6.66±0.02^{a}	6.66±0.04^{a}	6.67±0.01^{a}	6.69±0.03^{a}
4	6.70±0.02^{a}	6.68±0.03^{a}	6.63±0.02^{a}	6.66±0.02^{a}	6.65±0.03^{a}	6.72±0.03^{a}	6.68±0.02^{a}
5	6.70±0.03^{a}	6.71±0.01^{a}	6.63±0.05^{a}	6.64±0.05^{a}	6.62±0.05^{a}	6.73±0.07^{a}	6.65±0.02^{a}
6	6.63±0.03^{a}	6.62±0.05^{a}	6.56±0.04^{a}	6.63±0.03^{a}	6.59±0.04^{a}	6.53±0.08^{a}	6.46±0.01^{a}
7	6.35±0.01^{a}	6.38±0.05^{a}	6.42±0.05^{a}	6.32±0.05^{a}	6.22±0.03^{a}	6.22±0.04^{a}	6.42±0.2^{a}
8	5.80±0.1^{b}	5.87±0.07^{b}	5.98±0.08^{b}	6.18±0.08^{a}	5.90±0.07^{b}	5.76±0.02^{b}	6.02±0.1^{b}
9	4.97±0.1^{c}	5.11±0.08^{c}	5.15±0.04^{c}	5.39±0.09^{b}	5.12±0.07^{c}	5.28±0.05^{b}	5.45±0.06^{b}
10	4.60±0.05^{c}	4.70±0.06^{c}	4.78±0.07^{c}	4.80±0.08^{c}	4.77±0.07^{c}	4.98±0.02^{c}	5.21±0.1^{c}
11	4.46±0.01^{c}	4.50±0.01^{c}	4.49±0.01^{c}	4.53±0.01^{c}	4.51±0.01^{c}	4.73±0.08^{c}	4.88±0.03^{c}
12	-	-	-	-	-	4.49±0.01^{c}	4.67±0.02^{c}
13	-	-	-	-	-	-	4.50±0.01^{c}

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 3: Table 4.2: Changes of TTA in yoghurts[1] during fermentation at 41°C with final pH 4.5

Hour	AS	CP	IV	LB	MG	PL	PG
0	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.01^{a}	0.12±0.0 ^{a}	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.0^{a}
1	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.0 ^{a}	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.01^{a}
2	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.0^{a}	0.12±0.01^{a}	0.12±0.01^{a}	0.12±0.0^{a}	0.12±0.01^{a}
3	0.13±0.0^{a}	0.13±0.0^{a}	0.13±0.0^{a}	0.13±0.0^{a}	0.13±0.01^{a}	0.13±0.01^{a}	0.13±0.0^{a}
4	0.16±0.0^{a}	0.16±0.0^{a}	0.16±0.0^{a,b}	0.16±0.0^{a}	0.19±0.0^{a,b}	0.16±0.0^{a}	0.16±0.0^{a}
5	0.2±0.0^{a,b}	0.20±0.0^{b}	0.20±0.0^{b}	0.20±0.01^{b}	0.25±0.03^{b}	0.20±0.01^{b}	0.20±0.0^{b}
6	0.25±0.0 ^{b}	0.25±0.0 ^{b}	0.25±0.0 ^{b}	0.25±0.0^{b}	0.30±0.0^{b}	0.20±0.0 ^{b}	0.20±0.0^{b}
7	0.40±0.01^{b}	0.45±0.01^{b,c}	0.4±0.01^{b,c}	0.4±0.01^{c}	0.43±0.02^{c}	0.25±0.01^{b}	0.30±0.0^{c}
8	0.67±0.01^{c}	0.63±0.03^{c}	0.58±0.03^{c}	0.58±0.02^{c}	0.63±0.0 ^{d}	0.35±0.01^{c}	0.38±0.0 ^{c}
9	0.72±0.01^{c}	0.63±0.0^{c}	0.72±0.02^{d}	0.63±0.0^{d}	0.67±0.01^{d}	0.54±0.04^{d}	0.39±0.0^{c}
10	0.78±0.0^{c}	0.73±0.0^{c}	0.80±0.02^{d}	0.75±0.0 ^{e}	0.78±0.0^{d}	0.58±0.03^{d}	0.63±0.01^{d}
11	0.81±0.0^{c}	0.90±0.0^{c}	0.89±0.02^{d}	0.85±0.0 ^{e}	0.90±0.0 ^{d}	0.63±0.02^{e}	0.65±0.03^{d}
12	-	-	-	-	-	0.75±0.02^{e}	0.72±0.02^{d}
13	-	-	-	-	-	-	0.75±0.0^{d}

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 4: Table 4.3 Changes of pH in yoghurts[1] with initial pH 4.5 during storage

Time (day)	**AS**	**CP**	**IV**	**LB**	**MG**	**PL**	**PG**
0	4.47±0.01^{ax}	4.46±0.04^{ax}	4.47±0.03^{ax}	4.52±0.02^{ax}	4.46±0.05^{ax}	4.50±0.01^{ax}	4.52±0.01^{ax}
7	4.44±0.01^{ax}	4.45±0.04^{ax}	4.40±0.01^{ax}	4.45±0.01^{ax}	4.39±0.06^{ax}	4.42±0.01^{ax}	4.44±0.03^{ax}
14	4.29±0.03^{ax}	4.32±0.01^{ax}	4.32±0.01^{ax}	4.40±0.01^{ax}	4.35±0.01^{ax}	4.34±0.01^{ax}	4.36±0.01^{ax}
21	4.28±0.06^{ax}	4.25±0.03^{ax}	4.26±0.01^{ay}	4.32±0.01^{ax}	4.25±0.01^{ax}	4.28±0.01^{ax}	4.32±0.02^{ax}

[1] AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

[ab] different superscripts in the same row differ significantly (P<0.05)

[xy] different superscripts in the same column differ significantly (P<0.05)

Appendix 5: Table 4.4 Changes of TTA in yoghurts[1] with initial pH 4.5 during storage

Time (day)	AS	CP	IV	LB	MG	PL	PG
0	0.80 ± 0.01^{ax}	0.85 ± 0.02^{ax}	0.83 ± 0.02^{ax}	0.80 ± 0.04^{ax}	0.86 ± 0.03^{ax}	0.78 ± 0.02^{ax}	0.80 ± 0.02^{ax}
7	0.90 ± 0.01^{ax}	0.93 ± 0.02^{ax}	0.90 ± 0.01^{ax}	0.93 ± 0.03^{ay}	0.90 ± 0.04^{ax}	0.86 ± 0.01^{ax}	0.86 ± 0.04^{ax}
14	1.02 ± 0.02^{by}	0.98 ± 0.03^{ax}	1.04 ± 0.03^{by}	1.04 ± 0.03^{by}	0.97 ± 0.04^{ax}	0.90 ± 0.01^{ax}	0.95 ± 0.01^{ax}
21	1.10 ± 0.02^{by}	0.99 ± 0.01^{ax}	1.05 ± 0.01^{by}	1.05 ± 0.01^{by}	1.10 ± 0.01^{by}	0.93 ± 0.01^{ax}	0.95 ± 0.01^{ax}

[1] AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt
[ab] different superscripts in the same row differ significantly (P<0.05)
[xy] different superscripts in the same column differ significantly (P<0.05)

Appendix 6: Table 4.7 Changes of pH and %TTA in yoghurts (18 hour fermentation) in presence of herbs during storage at 4°C.

	0 day		3 days		6 days		12 days		21 days	
	pH	%TTA	**pH**	%TTA	**pH**	%TTA	**pH**	%TTA	**pH**	%TTA
As	**4.08± 0.03^{bx}**	1.02± 0.01 ^{bx}	**4.13± 0.03^{ax}**	0.96± 0.01 ^{ax}	**4.10± 0.03^{ax}**	0.97± 0.01 ^{ax}	**4.13± 0.04^{ax}**	0.99± 0.04 ^{ax}	**4.1 ± 0.02^{ax}**	0.97± 0.02 ^{ax}
Cp	**4.19± 0.02^{ax}**	0.97± 0.01 ^{ax}	**4.19± 0.04^{ax}**	0.95± 0.01 ^{ax}	**4.19± 0.05^{ax}**	0.95± 0.02 ^{ax}	**4.12± 0.02 ^{ax}**	0.97± 0.02 ^{ax}	**4.15± 0.06^{ax}**	0.94± 0.02 ^{ax}
Iv	**4.13± 0.01^{ax}**	0.97± 0.01 ^{ax}	**4.17± 0.01^{axx}**	0.96± 0.03 ^{ax}	**4.14± 0.04^{ax}**	0.95± 0.05 ^{ax}	**4.09± 0.04 ^{a}**	0.94± 0.01 ^{ax}	**4.13± 0.07^{ax}**	0.96± 0.03 ^{ax}
Lb	**4.21± 0.01^{ax}**	0.97± 0.01 ^{ax}	**4.18± 0.02^{ax}**	0.98± 0.03 ^{ax}	**4.15± 0.03^{ax}**	0.95± 0.01 ^{ax}	**4.15± 0.05^{ax}**	0.93± 0.01 ^{ax}	**4.16± 0.05^{ax}**	0.93± 0.02 ^{ax}
Mg	**4.17± 0.02^{ax}**	0.98± 0.03 ^{ax}	**4.2± 0.03^{ax}**	0.92± 0.03 ^{ax}	**4.13± 0.02^{ax}**	0.97± 0.01 ^{ax}	**4.15± 0.02^{ax}**	0.96± 0.01 ^{ax}	**4.2± 0.08^{ax}**	0.96± 0.02 ^{ax}
Pg	**4.3± 0.04 ^{ax}**	0.91± 0.03 ^{ax}	**4.24± 0.02^{ax}**	0.91± 0.03 ^{ax}	**4.19± 0.00^{ax}**	0.91± 0.01 ^{ax}	**4.23± 0.05^{axx}**	0.90± 0.01 ^{ax}	**4.2± 0.05^{ax}**	0.91± 0.02 ^{ax}
Plain	**4.23± 0.04^{ax}**	0.92± 0.01 ^{ax}	**4.24± 0.04^{ax}**	0.91± 0.03 ^{ax}	**4.18± 0.04^{ax}**	0.90± 0.02 ^{ax}	**4.21± 0.06^{ax}**	0.90±. 0.03 ^{ax}	**4.2± 0.08^{ax}**	0.91± 0.02 ^{ax}

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 7: Table 4.12 Effect of herbs water extract on ACE activity and ACE inhibition

	samples	0'	5'	10'	15'	20'	Abs0'-Abs20'	Average Abs	ACE activity	inhibition%
	Control1	1.238	1.128	1.058	0.999	0.947	0.291	0.302	**0.015**	---
	control2	1.274	1.162	1.116	1.047	0.96	0.314			
cold	**As1**	1.216	1.117	1.055	1.000	0.94	0.276	0.263	**0.013**	**13.30%**
	As2	1.211	1.11	1.042	0.990	0.961	0.25			
incubated	**As1**	1.195	1.097	1.055	0.986	0.932	0.263	0.257	**0.013**	**13.30%**
	As2	1.204	1.117	1.054	0.994	0.952	0.252			
cold	**Cp1**	1.275	1.228	1.155	1.094	1.049	0.236	0.248	**0.012**	**20%**
	Cp2	1.319	1.231	1.166	1.107	1.059	0.26			
incubated	**Cp1**	1.311	1.258	1.191	1.140	1.099	0.212	0.216	**0.011**	**27%**
	Cp2	1.201	1.127	1.069	1.029	0.98	0.221			
cold	**Iv1**	1.338	1.254	1.188	1.125	1.07	0.268	0.253	**0.013**	**13.30%**
	Iv2	1.276	1.197	1.141	1.086	1.039	0.237			
incubated	**Iv1**	1.273	1.188	1.119	1.069	1.013	0.26	0.251	**0.013**	**13.30%**
	Iv2	1.266	1.196	1.12	1.073	1.023	0.243			
cold	**Lb1**	1.365	1.266	1.209	1.165	1.116	0.249	0.238	**0.012**	**20%**
	Lb2	1.356	1.266	1.226	1.172	1.128	0.228			
incubated	**Lb1**	1.383	1.314	1.27	1.224	1.199	0.184	0.177	**0.0088**	**41.30%**
	Lb2	1.369	1.299	1.274	1.252	1.198	0.171			
cold	**Pg1**	1.884	1.83	1.813	1.773	1.737	0.147	0.133	**0.0067**	**55.30%**
	Pg2	1.83	1.788	1.75	1.728	1.71	0.12			
incubated	**Pg1**	1.769	1.743	1.713	1.705	1.688	0.081	0.081	**0.004**	**73.30%**
	Pg2	1.78	1.753	1.724	1.728	1.699	0.081			

* AS, *A.sinensis*; CP, *C.pilosula*; IV, *I.verum*; LB, *L.barbarum*; PG, *P.guajava*; Incubated: warmed in waterbath at 41^{o}C, Cold : kept in 4^{o}C, Abs: Absorbance at 340 nm

Appendix 8: Table 5.1 Correlations within pH, TTA, *Lactobacillus sp.* CFU/ml ×10^6, *S.thermophilus* CFU/mL×10^8

Correlation / Yoghurts	PH and TTA	PH and *Lactobacillus sp.*	PH and *S.thermophilus*	TTA and *Lactobacillus sp.*	TTA and *S.thermophilus*
A.sinensis	-0.678	0.045	-0.211	0.449	0.414
C.piosula	-0.215	0.360	0.628	0.197	-0.852
I.verum	0.581	0.611	0.288	0.819	0.908
L.barbarum	0.742	0.587	0.848	0.989	0.773
M.grosvenori	-0.585	0.336	0.711	-0.175	-0.793
P.guajava	0.054	0.909	0.636	0.346	0.391
Plain	0.651	-0.001	0.399	0.416	0.089

Appendix 9: Table 5.2 Correlation of specific activity of yoghurts with IC_{50} and OPA

Yoghurts / Correlation	***A.sinensis*-yoghurt**	***C.pilosula*-yoghurt**	***I.verum*-yoghurt**	***L.barbarum*-yoghurt**	***M.grosvenori*-yoghurt**	***P.guajava*-yoghurt**	**Plain yoghurt**
Specific activity and IC_{50}	0.906	0.950	0.932	0.999	-	0.994	0.845
Specific activity and OPA	-0.999	-0.639	-0.903	-0.889	-0.918	-0.797	-0.995

Appendix 10: Changes of moisture content in yoghurt during storage

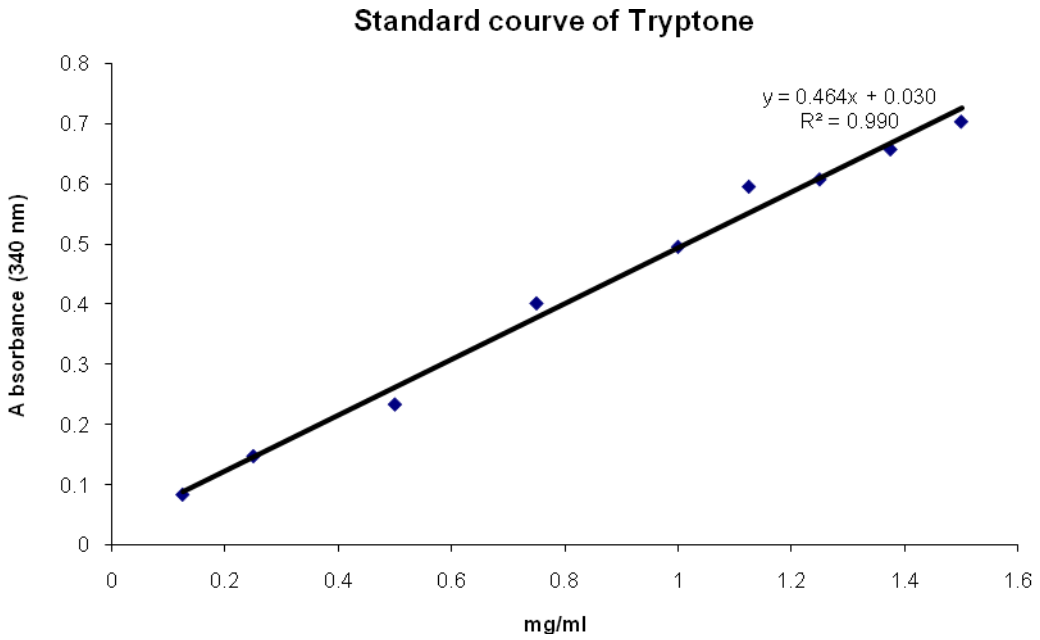
MOISTURE CONTENT					
Type of yoghurts \ Storage (day)	**0**	**3**	**6**	**12**	**21**
A.sinensis	87.06±0.03	87.10±0.01	87.06±0.01	87.45±0.05	87.37±0.03
C.pilusola	87.02±0.02	87.12±0.02	87.12±0.03	87.34±0.02	87.07±0.01
I.verum	87.29±0.04	87.41±0.01	87.08±0.03	87.31±0.03	87.57±0.04
L.barbarum	87.88±0.02	87.90±0.03	86.83±0.03	86.99±0.01	86.99±0.02
M.grosvenori	86.36±0.01	86.53±0.03	87.15±0.04	87.33±0.04	87.18±0.01
P.guajava	86.93±0.01	87.08±0.04	87.18±0.01	87.46±0.01	87.43±0.03
Plain	88.09±0.02	87.91±0.02	87.84±0.03	87.99±0.03	87.99±0.04

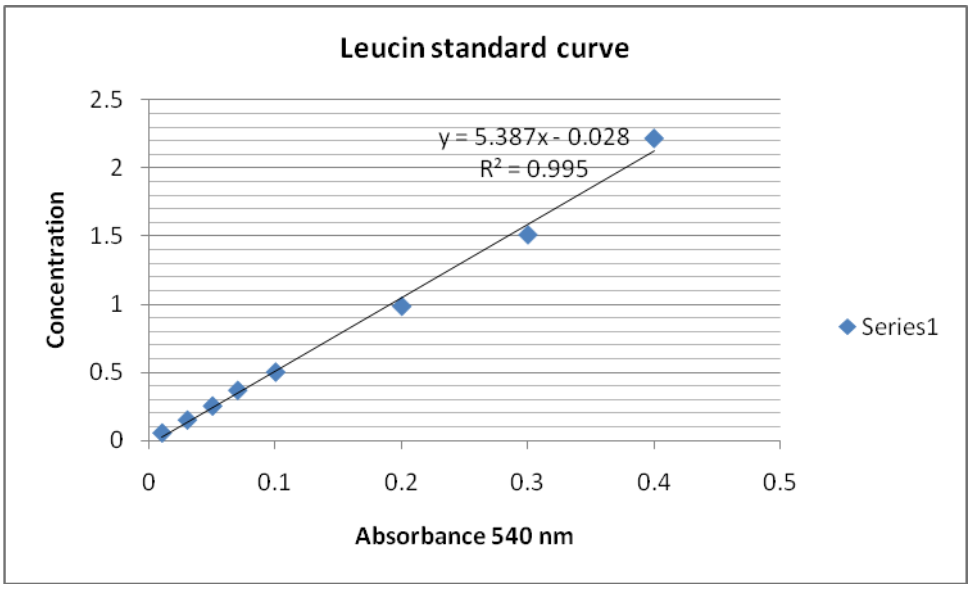
AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 11:
Different concentration (mg/ml) of Tryptone and Average of trypton absorbance at 340 nm wavelength

[Tryptone] (mg/ml)	**ABSORBANCE (340nm)**		
	1	**2**	**Mean**
0.125	0.083	0.085	0.084
0.25	0.150	0.146	0.148
0.50	0.234	0.234	0.234
0.75	0.400	0.404	0.402
1.00	0.498	0.496	0.497
1.125	0.596	0.596	0.596
1.25	0.611	0.607	0.609
1.375	0.602	0.654	0.658
1.50	0.703	0.705	0.752

Appendix 12: Typical standard curve of tryptone (mg/ml)





Appendix 13: Typical leucine standard curve with different concentration (mM/ml) of Leucin

Appendix 14: Changes of overall aroma in yoghurts during storage

Overall aroma	Storage (day)		
Yoghurt type	0	7	21
PL	7.13±0.2	6.68±0.2	7.07±0.2
AS	6.77±0.3	6.97±0.2	7.40±015
CP	5.97±0.3	6.43±0.3	6.47±0.3
IV	5.6±0.28	6.17±0.2	6.73±0.3
LB	6.6±0.21	6.43±0.2	6.4±0.20
MG	7.2±0.20	7.3±0.20	7.7±0.20
PG	7.0±0.20	6.9±0.10	7.7±0.30

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 15: Changes of overall appearance of yoghurts during storage

Overall appearance	Storage (day)		
Yoghurt type	0	7	21
PL	7.0±0.2	7.0±0.2	7.03±0.2
AS	6.5±0.2	6.7±0.3	7.0±0.2
CP	6.1±0.2	6.5±0.2	6.5±0.2
IV	6.2±0.2	6.6±0.2	6.8±0.3
LB	6.1±0.2	6.6±0.2	6.3±0.3
MG	6.4±0.3	6.7±0.2	7.4±0.3
PG	6.1±0.4	6.4±0.3	6.7±0.4

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 16: Changes of overall taste in yoghurts during storage

Overall taste	Storage (day)		
Yoghurt type	0	7	21
PL	6.77±0.2	6.23±0.3	6.33±0.3
AS	6.1±0.3	6.27±0.2	6.33±0.3
CP	5.87±0.3	6.17±0.2	5.93±0.3
IV	5.87±0.2	5.67±0.2	5.53±0.2
LB	6.6 ±0.2	6.33±0.2	5.67±0.2
MG	7.1 ± 0.2	6.8 ± 0.2	7.0 ± 0.3
PG	6.4 ± 0.2	6.5 ± 0.3	6.55±0.3

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 17: Changes of sourness in yoghurts during storage

Sourness		Storage (day)	
Yoghurt type	0	7	21
PL	6.23±0.3	6.07±0.2	5.23±0.4
AS	6.53±0.2	6.5±0.3	5.53±0.3
CP	6.9±0.3	6.7±0.2	6.33±0.3
IV	6.27±0.3	6.4±0.2	5.9±0.6
LB	5.5±0.3	6.07±0.2	5.77±0.3
MG	5.1±0.3	5.2±0.3	4.2±0.3
PG	6.6±0.1	6.57±0.3	6.11±0.2

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt

Appendix 18: Changes of bitterness of yoghurts during storage

Bitterness	Storage (day)		
Yoghurt type	0	7	21
PL	1.26±0.2	1.3 ± 0.1	1.1 ±0.1
AS	2.2±0.2	2.2 ±0.3	2.13±0.3
CP	1.8±0.3	1.3 ±0.1	1.2 ± 0.1
IV	1.43±0.1	1.53±0.1	1.13±0.1
LB	1.4 ±0.2	1.47±0.1	1.1±0.03
MG	1.5 ±0.2	1.5 ± 0.1	1.3 ± 0.2
PG	1.2 ±0.1	1.3 ± 0.1	1.18±0.3

AS, *A. sinensis*-yoghurt; CP, *C. pilosula*-yoghurt; IV, *I. verum*-yoghurt; LB, *L. barbarum*-yoghurt; MG, *M. grosvenori*-yoghurts; PG, *P. guajava*-yoghurt; PL, Plain-yoghurt