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**APPENDIX**

## Appendix A

### Experimental data

Appendix Table A1 Characteristics parameter of glass transition temperature

$T_g$  (onset),  $T_g$  (midpoint), and  $T_g$  (end) in °C for banana flakes at varying water activity.

Product	Water activity( $a_w$ )	Glass Transition temperature		
		$T_g$ (onset)	$T_g$ (midpoint)	$T_g$ (end)
Banana without maltodextrin	0.216	26.53±2.07	32.17±2.14	37.80±2.20
	0.321	7.27±1.11	15.76±0.08	24.25±0.94
	0.499	-2.58± 0.48	0.23 ±0.48	3.04 ±0.31
	0.628	-18.92± 0.25	-14.50± 0.61	-10.08± 0.97
	0.749	-49.16±1.54	-44.76±1.24	-40.36±0.95
Banana with 0.9% maltodextrin	0.216	31.22±0.38	36.65±0.44	42.08±0.51
	0.321	10.92±1.23	16.41±0.64	21.90±0.05
	0.499	-1.14±0.40	0.68±0.40	3.67±0.49
	0.628	-19.50± 1.90	-14.75±1.65	-10.00± 1.81
	0.749	-41.20±0.41	-36.16±0.26	-31.13±0.18
Banana with 1.8% maltodextrin	0.216	32.84±0.18	39.23±0.05	45.62±0.28
	0.321	14.53±0.52	20.65±0.96	26.77±1.39
	0.499	1.75±1.36	2.92±1.36	6.91±0.04
	0.628	-14.50± 1.30	-8.99±1.20	-3.47± 1.09
	0.749	-40.27±0.32	-35.74± 0.45	-31.22± 0.41
Banana with 2.7% maltodextrin	0.216	35.64± 0.07	40.43±0.22	45.22±0.37
	0.321	13.05± 0.97	19.79±1.82	24.70±0.85
	0.499	11.61± 0.02	18.13±0.01	24.65±0.42
	0.628	-3.62±0.41	0.36±0.21	4.33±0.84
	0.749	-43.65± 0.20	-38.58± 0.61	-33.52±0.99

Appendix Table A 2 Effect of storage time and temperature on water activity of banana flake.

Time (days)	Water Activity ( $a_w$ )			
	-18°C	23°C	35°C	45°C
0	0.240 ± 0.001 <sup>a</sup>	0.240 ± 0.001 <sup>a</sup>	0.240±0.001 <sup>a</sup>	0.240 ±0.001 <sup>a</sup>
10	0.239±0.002 <sup>a</sup>	0.239 ±0.002 <sup>a</sup>	0.230±0.002 <sup>a</sup>	0.213±0.001 <sup>b</sup>
20	0.240± 0.002 <sup>a</sup>	0.239±0.002 <sup>a</sup>	0.225±0.005 <sup>b</sup>	0.211±0.001 <sup>c</sup>
30	0.238±0.002 <sup>a</sup>	0.238 ±0.002 <sup>a</sup>	0.217±0.002 <sup>b</sup>	0.210±0.003 <sup>c</sup>
40	0.238±0.001 <sup>a</sup>	0.237±0.001 <sup>a</sup>	0.215±0.002 <sup>b</sup>	0.205±0.001 <sup>c</sup>
50	0.239±0.001 <sup>a</sup>	0.238±0.001 <sup>a</sup>	0.214±0.002 <sup>b</sup>	0.205±0.002 <sup>c</sup>
60	0.238±0.002 <sup>a</sup>	0.238±0.002 <sup>a</sup>	0.210±0.002 <sup>b</sup>	0.206±0.001 <sup>c</sup>
70	0.238±0.001 <sup>a</sup>	0.237±0.001 <sup>a</sup>	0.209±0.001 <sup>b</sup>	0.203±0.001 <sup>c</sup>
80	0.239±0.002 <sup>a</sup>	0.238±0.002 <sup>a</sup>	0.209±0.001 <sup>b</sup>	0.204±0.003 <sup>c</sup>
90	0.239±0.002 <sup>a</sup>	0.237±0.002 <sup>a</sup>	0.209±0.002 <sup>b</sup>	0.203±0.002 <sup>c</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A 3 The effect of storage temperature on  $L^*$  value of banana flake.

Storage time (day)	$L^*$ on Storage temperature			
	-18°C	23°C	35°C	45°C
0	45.07±0.02 <sup>a</sup>	45.07±0.02 <sup>a</sup>	45.07±0.02 <sup>a</sup>	45.07±0.02 <sup>a</sup>
10	46.01±0.35 <sup>a</sup>	45.28±0.38 <sup>b</sup>	45.81±0.43 <sup>ab</sup>	45.53±0.64 <sup>ab</sup>
20	44.98±0.76 <sup>bc</sup>	45.55±0.42 <sup>ab</sup>	46.22±0.53 <sup>a</sup>	44.18±0.64 <sup>c</sup>
30	45.73±0.65 <sup>a</sup>	46.03±0.34 <sup>a</sup>	45.81±0.48 <sup>a</sup>	44.18±0.38 <sup>b</sup>
40	45.69±0.69 <sup>a</sup>	45.95±0.38 <sup>a</sup>	45.79±0.29 <sup>a</sup>	44.28±0.72 <sup>b</sup>
50	45.92±0.74 <sup>a</sup>	45.50±0.68 <sup>a</sup>	46.18±0.53 <sup>a</sup>	43.83*±0.70 <sup>b</sup>
60	45.54±0.38 <sup>a</sup>	45.79±0.69 <sup>a</sup>	45.10± 0.37 <sup>a</sup>	42.93±0.69 <sup>b</sup>
70	45.67±0.25 <sup>a</sup>	44.98±0.64 <sup>b</sup>	45.92±0.56 <sup>a</sup>	42.69±0.42 <sup>c</sup>

Storage time (day)	L* on Storage temperature			
	-18°C	23°C	35°C	45°C
80	46.14±0.61 <sup>a</sup>	45.82±0.48 <sup>ab</sup>	45.46±0.54 <sup>b</sup>	43.35±0.14 <sup>c</sup>
90	46.01±0.90 <sup>a</sup>	46.01±0.90 <sup>a</sup>	45.54±0.15 <sup>a</sup>	41.99±0.55 <sup>b</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A 4 The effect of storage temperature on a\* value of banana flake.

Storage time (day)	a* on storage temperature			
	-18°C	23°C	35°C	45°C
0	14.57±0.17 <sup>a</sup>	14.57±0.17 <sup>a</sup>	14.57±0.17 <sup>a</sup>	14.57±0.17 <sup>a</sup>
10	14.05±0.13 <sup>c</sup>	14.34±0.21 <sup>b</sup>	14.53±0.20 <sup>b</sup>	15.02±0.20 <sup>a</sup>
20	14.43±0.11 <sup>a</sup>	14.40±0.13 <sup>a</sup>	13.92±0.30 <sup>a</sup>	14.03±0.21 <sup>b</sup>
30	14.43±0.11 <sup>b</sup>	13.92±0.30 <sup>c</sup>	14.37±0.18 <sup>b</sup>	15.10±0.24 <sup>a</sup>
40	14.40±0.13 <sup>b</sup>	14.03±0.03 <sup>c</sup>	14.41±0.21 <sup>b</sup>	14.75±0.10 <sup>a</sup>
50	14.06±0.26 <sup>a</sup>	14.03±0.41 <sup>a</sup>	14.28±0.28 <sup>a</sup>	14.35±0.16 <sup>a</sup>
60	15.04±0.38 <sup>a</sup>	14.56±0.19 <sup>b</sup>	14.98±0.22 <sup>a</sup>	15.04±0.20 <sup>a</sup>
70	14.22±0.24 <sup>b</sup>	14.49±0.19 <sup>a</sup>	14.60±0.11 <sup>a</sup>	14.51±0.16 <sup>a</sup>
80	13.99±0.35 <sup>b</sup>	14.21±0.24 <sup>b</sup>	14.70±0.20 <sup>b</sup>	14.70±0.11 <sup>a</sup>
90	14.33±0.23 <sup>b</sup>	14.37±0.26 <sup>b</sup>	14.77±0.15 <sup>a</sup>	14.68±0.15 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A 5 The effect of storage temperature on b\* value of banana flake.

Storage time (day)	b* on storage temperature			
	-18°C	23°C	35°C	45°C
0	23.60±0.12 <sup>a</sup>	23.60±0.12 <sup>a</sup>	23.60±0.12 <sup>a</sup>	23.60±0.12 <sup>a</sup>
10	23.44±0.25 <sup>a</sup>	23.08±0.36 <sup>b</sup>	23.31±0.41 <sup>ab</sup>	23.65±0.44 <sup>a</sup>
20	22.47±0.50 <sup>a</sup>	22.56±0.16 <sup>a</sup>	22.84±0.23 <sup>a</sup>	22.50±0.50 <sup>a</sup>
30	23.31±0.28 <sup>a</sup>	22.32±0.53 <sup>c</sup>	21.92±0.29 <sup>c</sup>	22.80±0.36 <sup>b</sup>
40	22.96±0.71 <sup>a</sup>	22.50±0.40 <sup>ab</sup>	22.42±0.25 <sup>ab</sup>	22.30±0.40 <sup>b</sup>
50	22.85±0.27 <sup>a</sup>	21.99±0.50 <sup>b</sup>	21.54±0.32 <sup>bc</sup>	21.44±0.52 <sup>c</sup>
60	23.04±0.34 <sup>a</sup>	23.04±0.19 <sup>b</sup>	14.98± 0.22 <sup>a</sup>	15.04±0.20 <sup>a</sup>
70	23.44±0.34 <sup>a</sup>	22.50±0.17 <sup>c</sup>	22.99±0.07 <sup>b</sup>	22.02±0.27 <sup>d</sup>
80	23.18±0.32 <sup>b</sup>	22.70±0.52 <sup>b</sup>	22.98±0.22 <sup>b</sup>	22.81±0.20 <sup>ab</sup>
90	23.04±0.64 <sup>a</sup>	22.80±0.61 <sup>ab</sup>	23.30±0.15 <sup>a</sup>	22.32±0.22 <sup>b</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A 6 The effect of storage temperature on reducing sugar of banana flake.

Time (days)	Reducing sugar			
	-18°C	23°C	35°C	45°C
0	16.44±1.12 <sup>a</sup>	16.44±1.12 <sup>a</sup>	16.44±1.12 <sup>a</sup>	16.44±1.12 <sup>a</sup>
10	16.39±0.25 <sup>a</sup>	16.36±0.39 <sup>a</sup>	16.41±0.35 <sup>a</sup>	16.44±1.12 <sup>a</sup>
20	16.37±0.36 <sup>a</sup>	15.79±0.60 <sup>b</sup>	15.36±0.30 <sup>b</sup>	15.30±0.64 <sup>b</sup>
30	16.34±0.53 <sup>a</sup>	15.71±0.85 <sup>b</sup>	15.60±0.85 <sup>b</sup>	14.59±0.54 <sup>c</sup>
40	16.29±1.22 <sup>a</sup>	15.69±0.66 <sup>b</sup>	15.41±0.63 <sup>b</sup>	14.42±0.75 <sup>c</sup>
50	16.55±1.09 <sup>a</sup>	15.72±0.56 <sup>b</sup>	15.40±0.54 <sup>b</sup>	13.34±0.75 <sup>c</sup>
60	16.40±1.74 <sup>a</sup>	15.53±1.15 <sup>b</sup>	15.39±0.92 <sup>b</sup>	12.92±0.24 <sup>c</sup>
70	16.44±1.09 <sup>a</sup>	15.51±0.56 <sup>b</sup>	15.35±0.54 <sup>b</sup>	12.84±0.75 <sup>c</sup>

Time (days)	Reducing sugar			
	-18°C	23°C	35°C	45°C
80	16.35±0.30 <sup>a</sup>	15.52±0.14 <sup>b</sup>	15.38±0.39 <sup>b</sup>	12.70±0.45 <sup>c</sup>
90	16.37±0.52 <sup>a</sup>	15.57±0.10 <sup>b</sup>	15.39±1.02 <sup>b</sup>	12.71±0.31 <sup>c</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A7 The effect of storage temperature on brown color value of banana flake by QDA.

Storage time (day)	Intensity of brown color (cm.)			
	-18°C	23°C	35°C	45°C
0	9.26±0.23 <sup>a</sup>	9.26±0.23 <sup>a</sup>	9.26±0.23 <sup>a</sup>	9.26±0.23 <sup>a</sup>
10	9.13±0.88 <sup>a</sup>	8.86±0.40 <sup>a</sup>	9.26±0.90 <sup>a</sup>	9.18±0.50 <sup>a</sup>
20	9.49±0.79 <sup>a</sup>	9.50±0.81 <sup>a</sup>	9.13±0.63 <sup>a</sup>	9.65±0.93 <sup>a</sup>
30	9.33±0.24 <sup>a</sup>	9.32±0.35 <sup>a</sup>	9.20±0.35 <sup>a</sup>	9.76±0.94 <sup>a</sup>
40	9.44±0.19 <sup>a</sup>	9.43±0.28 <sup>a</sup>	9.49±0.25 <sup>a</sup>	9.76±0.29 <sup>a</sup>
50	9.42±0.28 <sup>a</sup>	9.62±0.28 <sup>a</sup>	9.54±0.28 <sup>a</sup>	9.86±0.41 <sup>a</sup>
60	9.39±0.63 <sup>c</sup>	9.49±0.30 <sup>bc</sup>	9.65±0.23 <sup>b</sup>	10.01±0.26 <sup>a</sup>
70	9.44±0.19 <sup>b</sup>	9.53±0.28 <sup>b</sup>	9.55±0.25 <sup>b</sup>	10.05±0.31 <sup>a</sup>
80	9.46±0.32 <sup>b</sup>	9.46±0.27 <sup>b</sup>	9.52±0.19 <sup>b</sup>	10.10±0.32 <sup>a</sup>
90	9.48±0.30 <sup>b</sup>	9.55±0.26 <sup>b</sup>	9.63±0.31 <sup>b</sup>	10.01±0.25 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A 8 The effect of storage temperature on crispness value of banana flake by QDA.

Storage time (day)	Intensity of crispness (cm.)			
	-18°C	23°C	35°C	45°C
0	10.23±0.87 <sup>a</sup>	10.23±0.87 <sup>a</sup>	10.23±0.87 <sup>a</sup>	10.23±0.87 <sup>a</sup>
10	10.01±0.90 <sup>a</sup>	10.10±0.25 <sup>a</sup>	10.04±0.46 <sup>a</sup>	10.12±0.62 <sup>a</sup>
20	10.17±0.32 <sup>b</sup>	10.44±0.81 <sup>b</sup>	10.52±0.73 <sup>a</sup>	10.57±0.93 <sup>a</sup>
30	10.37±0.27 <sup>b</sup>	10.54±0.88 <sup>a</sup>	10.45±0.36 <sup>a</sup>	10.50±0.89 <sup>a</sup>
40	10.19±0.39 <sup>a</sup>	10.40±0.47 <sup>a</sup>	10.44±0.38 <sup>a</sup>	10.49±0.56 <sup>a</sup>
50	10.57±0.51 <sup>a</sup>	10.39±0.38 <sup>a</sup>	10.51±0.67 <sup>a</sup>	10.45±0.49 <sup>a</sup>
60	10.20±0.35 <sup>b</sup>	10.48±0.35 <sup>a</sup>	10.62±0.32 <sup>a</sup>	10.55±0.46 <sup>a</sup>
70	10.20±0.43 <sup>b</sup>	10.39±0.44 <sup>ab</sup>	10.44±0.36 <sup>ab</sup>	10.53±0.47 <sup>a</sup>
80	10.16±0.29 <sup>bc</sup>	10.17±0.40 <sup>bc</sup>	10.37±0.33 <sup>ab</sup>	10.55±0.41 <sup>a</sup>
90	10.08±0.33 <sup>a</sup>	10.14±0.63 <sup>a</sup>	10.27±0.68 <sup>a</sup>	10.30±0.69 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A 9 The effect of storage temperature on adhesiveness value of banana flake by QDA.

Storage time (day)	Intensity of adhesiveness (cm.)			
	-18°C	23°C	35°C	45°C
0	5.29±0.50 <sup>a</sup>	5.29±0.50 <sup>a</sup>	5.29±0.50 <sup>a</sup>	5.29±0.50 <sup>a</sup>
10	5.07±0.67 <sup>a</sup>	5.08±0.58 <sup>a</sup>	5.14±0.53 <sup>a</sup>	5.05±0.53 <sup>a</sup>
20	5.19±0.47 <sup>a</sup>	5.11±0.51 <sup>a</sup>	5.07±0.36 <sup>a</sup>	5.06±0.54 <sup>a</sup>
30	4.96±0.21 <sup>a</sup>	4.87±0.96 <sup>a</sup>	4.95±0.45 <sup>a</sup>	5.10±0.55 <sup>a</sup>
40	5.11±0.55 <sup>a</sup>	5.03±0.50 <sup>a</sup>	5.16±0.32 <sup>a</sup>	5.04±0.65 <sup>a</sup>
50	4.89±0.5 <sup>a</sup>	4.95±0.58 <sup>a</sup>	5.05±0.58 <sup>a</sup>	4.88±0.59 <sup>a</sup>

Storage time (day)	Intensity of adhesiveness (cm.)			
	-18°C	23°C	35°C	45°C
60	5.18±0.48 <sup>a</sup>	5.16±0.40 <sup>a</sup>	5.13±0.41 <sup>a</sup>	5.07±0.54 <sup>a</sup>
70	5.18±0.51 <sup>a</sup>	5.09±0.46 <sup>a</sup>	5.12±0.41 <sup>a</sup>	4.98±0.52 <sup>a</sup>
80	5.20±0.56 <sup>a</sup>	5.21±0.45 <sup>a</sup>	5.16±0.42 <sup>a</sup>	5.18±0.63 <sup>a</sup>
90	5.24±0.64 <sup>a</sup>	5.12±0.37 <sup>a</sup>	5.20±0.38 <sup>a</sup>	5.17±0.42 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A10 The effect of storage temperature on odor roast banana value of banana flake by QDA.

Storage time (day)	Intensity of roast banana (cm.)			
	-18°C	23°C	35°C	45°C
0	7.62±0.36 <sup>a</sup>	7.62±0.36 <sup>a</sup>	7.62±0.36 <sup>a</sup>	7.62±0.36 <sup>a</sup>
10	7.11±0.74 <sup>a</sup>	7.14±0.83 <sup>a</sup>	6.92±0.83 <sup>a</sup>	6.72±0.82 <sup>a</sup>
20	7.03±0.37 <sup>b</sup>	7.70±0.62 <sup>a</sup>	7.06±0.46 <sup>b</sup>	7.10±0.86 <sup>b</sup>
30	7.19±0.67 <sup>a</sup>	7.12±0.69 <sup>a</sup>	7.26±0.85 <sup>a</sup>	7.14±0.78 <sup>a</sup>
40	7.43±0.28 <sup>a</sup>	7.53±0.37 <sup>a</sup>	7.43±0.29 <sup>a</sup>	7.49±0.30 <sup>a</sup>
50	7.42±0.44 <sup>a</sup>	7.45±0.27 <sup>a</sup>	7.48±0.36 <sup>a</sup>	7.57±0.29 <sup>a</sup>
60	7.59±0.27 <sup>a</sup>	7.64±0.27 <sup>a</sup>	7.67±0.18 <sup>a</sup>	7.72±0.23 <sup>a</sup>
70	7.60±0.26 <sup>a</sup>	7.51±0.27 <sup>a</sup>	7.51±0.28 <sup>a</sup>	7.57±0.38 <sup>a</sup>
80	7.56±0.24 <sup>a</sup>	7.40±0.22 <sup>a</sup>	7.42±0.19 <sup>a</sup>	7.46±0.26 <sup>a</sup>
90	7.58±0.26 <sup>a</sup>	7.41±0.44 <sup>a</sup>	7.57±0.40 <sup>a</sup>	7.53±0.45 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A11 The effect of storage temperature on sweetness value of banana flake by QDA.

Storage time (day)	Intensity of sweetness (cm.)			
	-18°C	23°C	35°C	45°C
0	5.04±0.49 <sup>a</sup>	5.04±0.49 <sup>a</sup>	5.04±0.49 <sup>a</sup>	5.04±0.49 <sup>a</sup>
10	4.58±0.93 <sup>a</sup>	4.26±0.96 <sup>a</sup>	4.26±0.96 <sup>a</sup>	4.61±0.93 <sup>a</sup>
20	5.05±0.49 <sup>a</sup>	4.26±0.96 <sup>b</sup>	4.61±0.87 <sup>ab</sup>	4.26±0.81 <sup>b</sup>
30	4.99±0.94 <sup>a</sup>	4.88±0.23 <sup>a</sup>	4.70±0.68 <sup>a</sup>	4.70±0.53 <sup>a</sup>
40	4.72±0.42 <sup>a</sup>	4.16±0.80 <sup>a</sup>	4.60±0.44 <sup>a</sup>	4.72±0.45 <sup>a</sup>
50	4.58±0.41 <sup>a</sup>	4.61±0.36 <sup>a</sup>	4.60±0.37 <sup>a</sup>	4.67±0.39 <sup>a</sup>
60	4.65±0.31 <sup>a</sup>	4.65±0.33 <sup>a</sup>	4.69±0.29 <sup>a</sup>	4.72±0.28 <sup>a</sup>
70	4.52±0.31 <sup>a</sup>	4.54±0.34 <sup>a</sup>	4.53±0.36 <sup>a</sup>	4.54±0.35 <sup>a</sup>
80	4.50±0.53 <sup>a</sup>	4.44±0.48 <sup>a</sup>	4.41±0.61 <sup>a</sup>	4.39±0.48 <sup>a</sup>
90	4.49±0.41 <sup>a</sup>	4.46±0.41 <sup>a</sup>	4.42±0.34 <sup>a</sup>	4.59±0.82 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

Appendix Table A12 The effect of storage temperature on flavor roast banana value of banana flake by QDA.

Storage time (day)	Intensity of flavor roast banana (cm.)			
	-18°C	23°C	35°C	45°C
0	9.27±0.33 <sup>a</sup>	9.27±0.33 <sup>a</sup>	9.27±0.33 <sup>a</sup>	9.27±0.33 <sup>a</sup>
10	8.42±0.80 <sup>a</sup>	8.58±0.53 <sup>a</sup>	8.56±0.51 <sup>a</sup>	8.70±0.51 <sup>a</sup>
20	8.57±0.55 <sup>a</sup>	8.34±0.35 <sup>a</sup>	8.39±0.34 <sup>a</sup>	8.43±0.37 <sup>a</sup>
30	8.50±0.54 <sup>a</sup>	8.56±0.38 <sup>a</sup>	8.70±0.48 <sup>a</sup>	8.68±0.41 <sup>a</sup>
40	8.48±0.57 <sup>a</sup>	8.54±0.52 <sup>a</sup>	8.53±0.50 <sup>a</sup>	8.42±0.64 <sup>a</sup>
50	8.52±0.55 <sup>a</sup>	8.64±0.49 <sup>a</sup>	8.66±0.54 <sup>a</sup>	8.76±0.46 <sup>a</sup>

Storage time (day)	Intensity of flavor roast banana (cm.)			
	-18°C	23°C	35°C	45°C
60	8.68±0.47 <sup>a</sup>	8.57±0.41 <sup>a</sup>	8.57±0.41 <sup>a</sup>	8.64±0.52 <sup>a</sup>
70	7.75±0.56 <sup>a</sup>	7.92±0.69 <sup>a</sup>	8.24±0.68 <sup>a</sup>	7.73±0.21 <sup>a</sup>
80	7.85±0.91 <sup>b</sup>	8.23±0.34 <sup>a</sup>	8.11±0.54 <sup>ab</sup>	7.69±0.45 <sup>b</sup>
90	7.46±0.87 <sup>a</sup>	7.37±0.90 <sup>a</sup>	7.57±0.90 <sup>a</sup>	7.53±0.90 <sup>a</sup>

<sup>a</sup> Means within the same row with different letters are significantly different ( $p \leq 0.05$ ) by Duncan's New Multiple-Rang Test (DMRT).

## Appendix B

### Sensory Test

Sensory Evaluation Sheet Preference Ranking Test						
Product... Banana flake.						
Date.....						
Name.....						Sex
.....						
Time test.....						
Age.....						
Method : After testing all products, give the appropriate numerical sensory evaluation score for each of the following factor.						
Numerical scoring code:						
1	= dislike extremely					6 = like slightly
2	= dislike very much					7 = like moderately
3	= dislike moderately					8 = like very much
4	= dislike slightly					9 = like extremely
5	= neither like nor dislike					
Sample no.	Appearance	Color	Flavor	Crispness	Taste	Overall liking
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
Other comments, If any						
.....						
.....						
.....						

Appendix Figure 1 Ballot used in the preference ranking test of banana flake.

Panelist Code #.....Date.....Sample  
 No.....

Banana Flake

Place a vertical line mark through the line scale to indicate the intensity of each attribute (The scale is from 0 to 15 cm.)

**Appearance**

**1. Banana color**

light brown |-----| dark brown |

Texture

**2. Crispness**

Crumbles |-----| fractures |

**3 Adheseiveness**

Breaks |-----| deform |

Odor

**4. Roast Banana**

Low |-----| high |

Tastes

**5. Sweet**

Weak |-----| strong |

Flavor

**6. Roast Banana**

Weak |-----| strong |

Comment.....  
 .....

Appendix Figure 2 Ballot used in the descriptive analysis of banana flake.

## Consumer Survey Questionnaire

### Topic: Consumer Acceptance Test of Banana Flake

#### Product Information

Banana flake is a product which is made from banana adding stabilizer. The nutritional values are carbohydrate and potassium. The product characteristic is a brown small flake. This product is a snack food or consuming with milk.

#### Instructions

**Please answer the questions and chose the most appropriate item. One answer is required otherwise specified. Please answer every question.**

#### Part 1 Demographic data

1. Sex

Male  Female

2. Age

9-11 years old  12-14 years old

15-17 years old  18-19 years old

20-22 years old

3. Education

Primary school  Junior high school

Senior high school  Diploma

Bachelor degree

**Part 2 Acceptance Test of Banana Flake**

4. Do you always have breakfast?

- Yes  No

5. When do you normally have the flake product? (chose more than one)

- Breakfast  Morning snack  
 Lunch  Afternoon snack  
 Dinner  Supper (snack)  
 Other: \_\_\_\_\_

6. What do you think about the nutrition value of snack product and ready-to-eat breakfast cereal?

- Very high  High  
 Moderate  Low  
 Very low

7. Do you interested in the banana flake which contained nutritional value as carbohydrate and potassium?

- Yes  No

8. What do you think about advantage of snack and ready-to-eat breakfast cereal from banana? (chose more than one)

- Increase product items  
 Adding nutritional value  
 Value added the banana  
 Other: \_\_\_\_\_

9. Please test the banana flake sample and weight your liking score by put  $\surd$  in the box which is directly to your opinion. Where the rating are as following:

- |                              |                     |
|------------------------------|---------------------|
| 1 = Dislike extremely        | 6 = Like slightly   |
| 2 = Dislike very much        | 7 = Like moderately |
| 3 = Dislike moderately       | 8 = Like very much  |
| 4 = Dislike slightly         | 9 = Like extremely  |
| 5 = Neither like nor dislike |                     |

Attributes	9	8	7	6	5	4	3	2	1
Color									
Odor									
Flavor									
Crispness									
Appearance									
Overall liking									

Other comments, If any
.....
.....
.....
.....

10. What attribute of banana flake should be improved? (chosed more than one)

- |                                  |                                 |
|----------------------------------|---------------------------------|
| <input type="checkbox"/> Odor    | <input type="checkbox"/> Color  |
| <input type="checkbox"/> Texture | <input type="checkbox"/> Flavor |
| <input type="checkbox"/> Other:  |                                 |

11. What do you think about the optimum price of the banana flake which is packed in aluminum foil in the paper box with 25 g? (As the small size of corn flake is 9-10 bath)

- ( ) Lower price: \_\_\_\_\_ bath/ pack  
 ( ) Same price: \_\_\_\_\_ bath/ pack  
 ( ) Higher price: \_\_\_\_\_ bath/ pack

12. How much banana flake do you eat?

- ( ) 1-2 pack                      ( ) 3-4 pack  
 ( ) 5-6 pack                      ( ) 7-8 pack

13. Where do you store the banana flake at your home?

- ( ) Room temperature place ( ) Refrigerator

14. What do you eat banana flake with?

- ( ) Milk                              ( ) Fruit juice  
 ( ) Water                            ( ) Nothing

15. Do you accept this banana flake?

- ( ) Yes                              ( ) No

Because \_\_\_\_\_  
 \_\_\_\_\_

16. Do you want to buy this banana flak?

- ( ) Buy      ( ) Not buy      ( ) Not sure

Because: (chose more than one)

- ( ) The nutritional value of the product  
 ( ) Value added the banana material  
 ( ) Familiar to the product  
 ( ) Other \_\_\_\_\_

-----  
**Thank you for your corporation**