

Supporting information

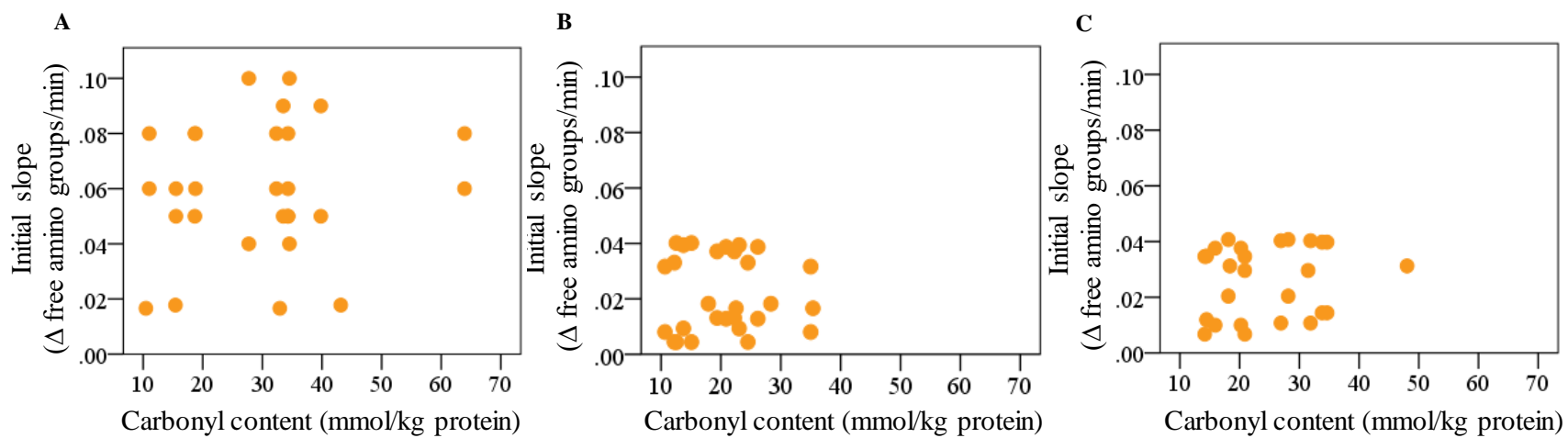


Figure 1. Relationship between initial slope (Δ free amino groups/min) and carbonyl content (mmol/kg protein) of SPC (A), SPI (B) and SPI/pectin (C) samples (protein ingredients and processed matrices).

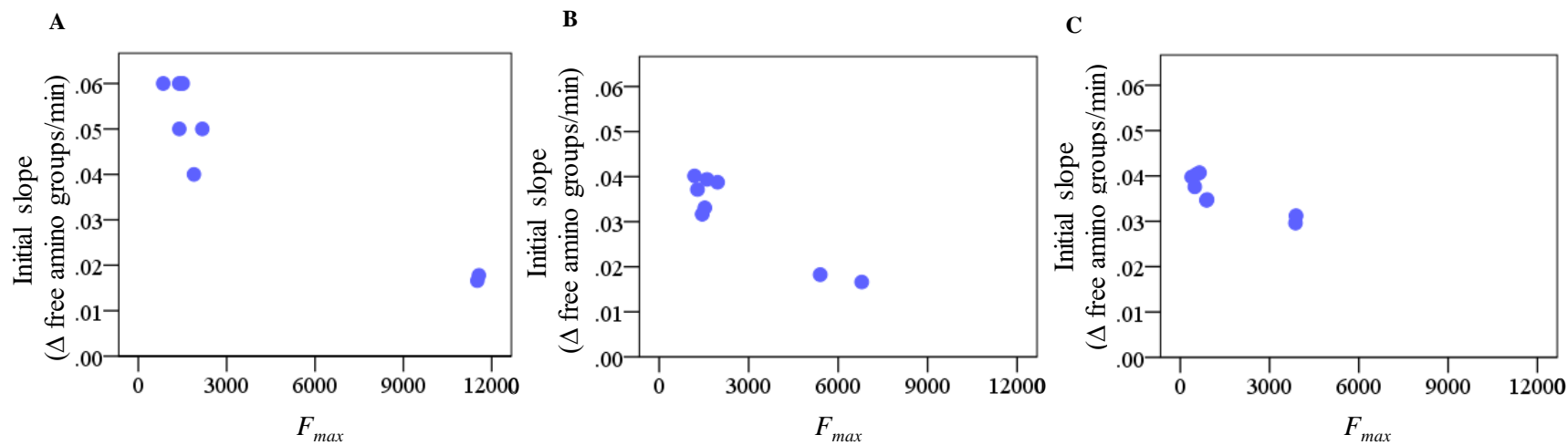


Figure 2. Relationship between initial slope (Δ free amino groups/min) and exposed-surface hydrophobicity (F_{max}) of SPC (A), SPI (B) and SPI/pectin (C) samples (protein ingredients and processed matrices).

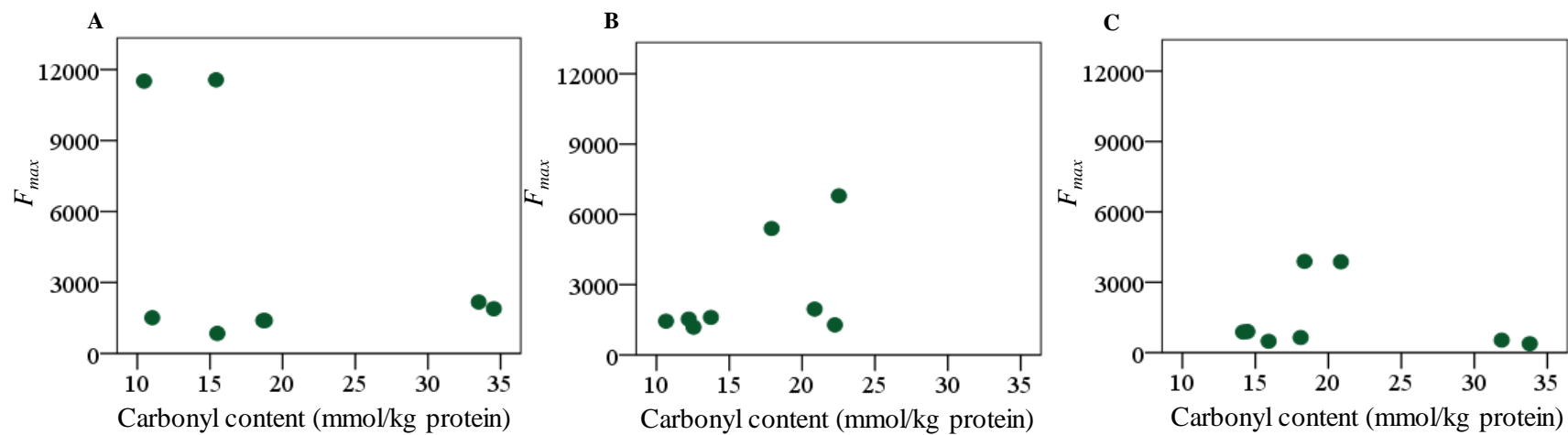


Figure 3. Relationship between exposed-surface hydrophobicity (F_{max}) and carbonyl content (mmol/kg protein) of SPC (A), SPI (B) and SPI/pectin (C) samples (protein ingredients and processed matrices).

Table 1. Peptides size (kDa) distribution of unheated soy ingredients (protein suspensions) obtained by size-exclusion chromatography.

Peptides size (kDa)	SPC		
	20 min	60 min	180 min
>50	6.01 ± 0.28 a	3.80 ± 0.06 a	2.55 ± 0.21 a
50-10	27.57 ± 2.21 a	25.09 ± 0.12 a	21.51 ± 0.41 a
10-4	33.43 ± 3.05 a	34.17 ± 0.20 a	31.92 ± 0.60 a
4-2	36.06 ± 0.00 a	37.39 ± 0.28 a	37.93 ± 0.75 a
<2	92.62 ± 9.49 a	110.81 ± 0.99 a	122.45 ± 2.18 a
	SPI		
>50	4.22 ± 0.90 a	2.79 ± 0.38 a	2.15 ± 0.07 a
50-10	25.50 ± 1.54 a	21.91 ± 0.93 b	19.13 ± 0.80 b
10-4	33.36 ± 1.83 a	31.69 ± 1.51 a	29.49 ± 1.41 a
4-2	34.70 ± 1.89 a	35.49 ± 1.74 a	35.71 ± 1.72 a
<2	98.69 ± 5.45 a	108.57 ± 5.84 a	118.91 ± 4.62 a
	SPI/pectin		
>50	1.07 ± 0.48 b	1.39 ± 0.21 b	0.86 ± 0.60 a
50-10	11.78 ± 0.84 b	10.35 ± 0.22 c	8.50 ± 0.36 c
10-4	21.57 ± 1.01 b	20.85 ± 0.17 b	18.54 ± 0.29 b
4-2	25.97 ± 1.18 b	26.76 ± 0.21 b	25.15 ± 0.04 a
<2	120.29 ± 5.77 a	138.47 ± 1.81 b	147.64 ± 0.06 b

Results are expressed as mean ± standard deviation (n = 2 independent samples measured in duplicate). Different letters per column refers to significant difference among samples within the same digestion time and peptide size ($p < 0.05$). Peptide size distribution of the simulated gastric fluid: > 50kDa: 1.62 ± 0.68 ; 50-10 kDa: 6.3 ± 0.52 ; 10-4 kDa: 6.52 ± 0.29 ; 4-2 kDa: 6.13 ± 0.26 ; < 2 kDa: 28.28 ± 1.17 kDa.

Table 2. Peptides size (kDa) distribution of processed soy-based matrices obtained by size-exclusion chromatography.

Process temperature	Peptides size (kDa)	SPC					
		Cylinder-shape			Ground		
		20 min	60 min	180 min	20 min	60 min	180 min
100 °C	>50	0.93 ± 0.16 *a	1.97 ± 0.67 a	3.44 ± 0.73 a	3.88 ± 0.02 †a	4.23 ± 0.19 a	3.39 ± 0.30 a
	50-10	2.07 ± 0.33 *a	4.09 ± 0.66 *a	8.28 ± 1.46 *a	17.07 ± 0.39 †a	21.47 ± 0.21 †a	19.98 ± 0.32 †a
	10-4	3.17 ± 0.44 *a	6.65 ± 0.82 *a	14.91 ± 2.19 *a	21.31 ± 0.45 †a	29.93 ± 0.41 †a	30.58 ± 0.30 †a
	4-2	3.94 ± 0.47 *a	7.97 ± 0.89 *a	18.24 ± 2.49 a	22.39 ± 0.45 †a	34.32 ± 0.49 †a	38.59 ± 0.38 a
	<2	40.31 ± 1.97 *a	59.51 ± 4.20 *a	113.22 ± 11.11 *ab	81.92 ± 0.88 †a	124.58 ± 1.02 †a	154.05 ± 0.73 †a
120 °C	>50	0.78 ± 0.04 *a	1.06 ± 0.17 *a	2.68 ± 0.75 a	4.62 ± 0.70 †a	4.43 ± 0.46 †a	3.27 ± 0.14 a
	50-10	1.85 ± 0.00 *a	3.33 ± 0.48 *a	7.62 ± 1.90 *a	18.01 ± 1.14 †ab	21.75 ± 0.88 †a	20.19 ± 0.05 †a
	10-4	2.82 ± 0.08 *a	5.60 ± 0.75 *a	13.38 ± 3.02 *a	22.09 ± 1.26 †a	29.71 ± 1.22 †a	30.33 ± 0.13 †a
	4-2	3.52 ± 0.09 *a	6.73 ± 0.83 *a	16.00 ± 3.40 a	23.23 ± 1.32 †a	33.96 ± 1.52 †a	38.05 ± 0.24 a
	<2	38.74 ± 0.05	54.27 ± 3.46 *b	101.19 ± 15.18 *b	84.07 ± 3.66 †a	121.87 ± 5.89 †a	150.21 ± 1.97 †a
140 °C	>50	1.04 ± 0.00 *a	1.93 ± 0.07 *a	4.94 ± 0.44 a	5.83 ± 0.24 †b	5.71 ± 0.02 b	3.71 ± 0.12 †a
	50-10	2.65 ± 0.01 *a	5.51 ± 0.12 *b	12.75 ± 0.77 *a	20.27 ± 0.26 †b	24.28 ± 0.14 †b	21.84 ± 0.04 †b
	10-4	3.62 ± 0.07 *a	8.40 ± 0.20 *a	20.60 ± 1.08 *a	23.50 ± 0.62 †a	31.25 ± 0.46 †a	30.81 ± 0.12 †a
	4-2	4.35 ± 0.11 *a	9.91 ± 0.26 *a	24.64 ± 1.19 a	24.34 ± 0.82 †a	35.19 ± 0.73 †a	37.84 ± 0.13 a
	<2	45.06 ± 0.44 *ab	73.47 ± 1.47 *c	155.03 ± 5.45 a	87.16 ± 1.97 †a	125.28 ± 3.10 †a	145.78 ± 0.08 a
		SPI					
		Cylinder-shape			Ground		
		20 min	60 min	180 min	20 min	60 min	180 min
100 °C	>50	0.39 ± 0.17 *a	0.21 ± 0.05 *a	0.07 ± 0.02 *a	2.26 ± 0.34 †a	3.03 ± 0.58 †a	1.82 ± 0.09 †a
	50-10	1.88 ± 0.06 *a	1.81 ± 0.05 *a	2.00 ± 0.02 *a	14.18 ± 1.36 †	20.23 ± 0.68 †a	21.27 ± 0.35 †a
	10-4	3.17 ± 0.10 *a	3.96 ± 0.15 *a	6.24 ± 0.26 *a	17.48 ± 2.04 †	27.87 ± 2.50 †a	32.06 ± 0.10 †a
	4-2	4.47 ± 0.15 *a	6.56 ± 0.29 *a	12.10 ± 0.56 *a	17.65 ± 2.31 †	30.65 ± 4.01 †a	37.63 ± 0.06 †a
	<2	29.44 ± 0.93 *a	44.27 ± 1.57 *a	87.97 ± 3.79 *a	59.18 ± 1.85 †	93.87 ± 13.13 †a	116.56 ± 2.36 †a
120 °C	>50	0.21 ± 0.17 *a	0.16 ± 0.05 *b	0.09 ± 0.02 *a	3.05 ± 0.13 †a	2.93 ± 0.53 †a	1.61 ± 0.11 †a
	50-10	1.69 ± 0.28 *a	1.89 ± 0.02 *a	2.17 ± 0.08 *a	14.65 ± 1.11 †a	20.34 ± 0.79 †a	21.20 ± 0.48 †a
	10-4	3.10 ± 0.19 *a	4.18 ± 0.10 *a	6.72 ± 0.47 *a	17.75 ± 1.86 †a	27.93 ± 2.49 †a	31.84 ± 0.35 †a
	4-2	4.53 ± 0.19 *a	6.87 ± 0.24 *a	12.89 ± 1.03 *a	17.89 ± 2.15 †a	30.70 ± 3.91 †a	37.48 ± 0.07 †a
	<2	28.52 ± 0.54 *a	43.87 ± 1.62 *a	85.38 ± 1.18 *a	60.79 ± 0.43 †a	93.42 ± 12.73 †a	120.98 ± 6.61 †a
140 °C	>50	1.97 ± 0.23 *b	2.12 ± 0.14 ±c	1.90 ± 0.15 b	2.84 ± 0.04 †a	2.79 ± 0.36 a	2.07 ± 0.09 b
	50-10	7.64 ± 0.00 *b	10.08 ± 0.37 *b	14.43 ± 1.25 *b	14.62 ± 1.16 †a	20.35 ± 1.28 †a	21.78 ± 0.29 †a
	10-4	8.88 ± 0.07 *b	13.01 ± 0.48 *b	21.20 ± 2.14 *b	17.66 ± 1.90 †a	27.88 ± 2.82 †a	32.19 ± 0.32 †a
	4-2	8.89 ± 0.09 *b	14.00 ± 0.53 *b	25.17 ± 2.75 *b	17.76 ± 2.19 †a	30.58 ± 4.19 †a	37.77 ± 0.57 †a
	<2	38.62 ± 0.02 *b	54.08 ± 1.48 b	88.90 ± 9.74 a	59.87 ± 0.43 †a	92.41 ± 14.03 a	117.55 ± 1.55 a
		SPI/pectin					
		Cylinder-shape			Ground		
		20 min	60 min	180 min	20 min	60 min	180 min
100 °C	>50	1.80 ± 0.33 a	2.33 ± 0.19 *a	3.58 ± 0.04 a	3.11 ± 0.49 a	2.95 ± 0.03 †a	3.71 ± 1.26 a
	50-10	4.01 ± 0.67 *a	7.47 ± 0.25 *a	14.23 ± 0.83 *a	13.19 ± 0.81 †a	17.07 ± 0.54 †a	19.47 ± 0.35 †a
	10-4	5.51 ± 0.63 *a	10.58 ± 0.17 *a	21.09 ± 1.45 *a	17.13 ± 0.83 †a	25.10 ± 0.84 †a	30.56 ± 0.91 †a
	4-2	5.88 ± 0.59 *a	11.37 ± 0.26 *a	23.42 ± 1.32 *a	17.92 ± 0.92 †a	28.76 ± 0.69 †a	38.30 ± 1.71 †a
	<2	37.52 ± 1.07 *a	52.05 ± 0.58 *a	85.27 ± 0.42 *a	62.33 ± 1.83 †a	96.69 ± 1.75 †a	136.11 ± 8.12 †a
120 °C	>50	0.86 ± 0.12 *b	1.31 ± 0.00 *b	2.14 ± 0.20 *b	4.32 ± 0.60 †a	4.44 ± 0.16 †b	3.62 ± 0.02 †a
	50-10	2.11 ± 0.19 *b	4.16 ± 0.07 *b	7.37 ± 0.06 *b	17.24 ± 1.06 †b	23.34 ± 0.94 †b	24.84 ± 0.07 †b
	10-4	3.46 ± 0.18 *b	6.97 ± 0.04 *b	13.25 ± 0.01 *b	20.07 ± 1.21 †a	30.37 ± 1.29 †b	35.71 ± 0.01 †b
	4-2	4.45 ± 0.18 *a	8.71 ± 0.02 *b	16.91 ± 0.06 *b	58.32 ± 2.82 †b	88.92 ± 3.39 †b	98.86 ± 26.22 †a
	<2	43.37 ± 0.86 *b	64.90 ± 0.36 *b	112.08 ± 1.08 *b	58.32 ± 2.82 †a	88.92 ± 3.39 †a	118.35 ± 1.35 †b
140 °C	>50	1.22 ± 1.22 *ab	1.81 ± 1.81 *b	2.88 ± 2.88 ab	4.28 ± 0.24 †a	5.21 ± 0.43 †b	4.53 ± 0.40 a
	50-10	2.82 ± 0.01 *ab	5.64 ± 0.36 *b	11.47 ± 1.66 *ab	16.76 ± 0.31 †b	23.90 ± 1.20 †b	27.60 ± 0.84 †a
	10-4	4.04 ± 0.07 *ab	7.91 ± 0.54 *b	16.74 ± 2.13 *ab	19.12 ± 0.30 †a	29.81 ± 1.37 †b	38.01 ± 1.09 †b
	4-2	4.60 ± 0.02 *a	8.96 ± 0.61 *b	19.29 ± 2.34 *ab	56.15 ± 0.64 †b	85.77 ± 2.84 †b	82.61 ± 2.11 †a
	<2	35.49 ± 0.98 *a	48.64 ± 1.38 *a	78.21 ± 6.87 *a	56.15 ± 0.64 †a	85.77 ± 2.84 †a	121.47 ± 3.15 †b

Results are expressed as mean ± standard deviation (n = 2 independent, each one measured in duplicate). Different icons (*/†) refers to significant difference between cylinder-shape and ground samples, within the same digestion time and peptide size (no icon = no difference) ($p < 0.05$). Different letters per column refers to significant difference among samples processed with different temperatures, within the same digestion time and peptide size ($p < 0.05$). Peptide size distribution of the simulated gastric fluid: > 50kDa: 1.62 ± 0.68 ; 50-10 kDa: 6.3 ± 0.52 ; 10-4 kDa: 6.52 ± 0.29 ; 4-2 kDa: 6.13 ± 0.26 ; < 2 kDa: 28.28 ± 1.17 kDa.