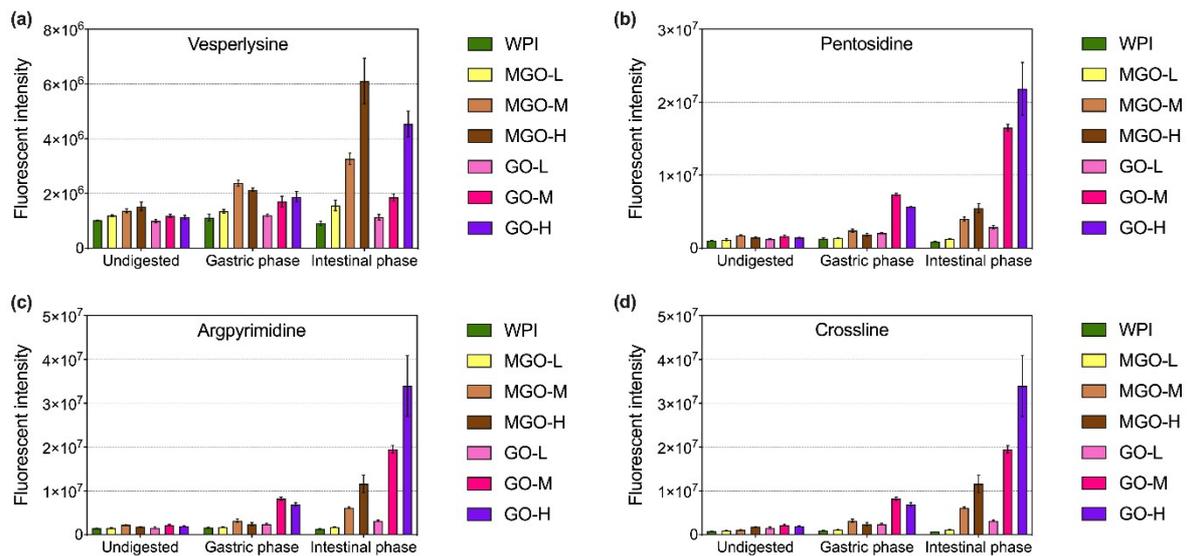


Supplementary Figure S1. Detailed information of the retention time and MS/MS

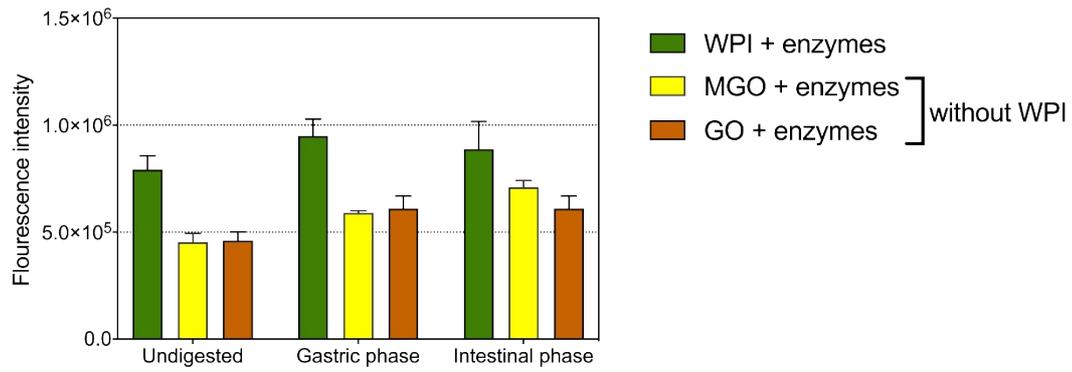
parameters of α -DCs and AGE standards.

Analyte	Retention time (min)	Internal standard	Precursor ion (m/z)	Quantitation ion (m/z)	Collision energy (eV)	Declustering potential (V)
CML	3.3	CML-d4	205.0	130.0	16.0	80
CEL	3.4	CEL-d4	219.0	130.0	17.0	90
Pyrraline	9.8	GOLD-15N2	255.0	174.9	17.0	60
Pentosidine	5.5	GOLD-15N2	380.2	251.0	32.0	100
MG-H1/3	3.8	MG-H1-d3	229.1	114.1	20.0	70
MG-H2	3.7	MG-H1-d3	229.1	116.0	19.0	80
Argpyrimidine	6.3	GOLD-15N2	255.1	139.7	22.0	70
G-H1	3.4	G-H1-13C2	215.2	116.1	19.0	100
GOLD	3.4	GOLD-15N2	328.2	130.1	31.0	100
MOLD	3.4	GOLD-15N2	342.3	297.1	30.0	100
CML-d4	3.3	/	209.0	88.0	26.0	90
CEL-d4	3.4	/	223.0	134.0	18.0	90
GOLD-15N2	3.4	/	330.2	284.2	28.0	100
MG-H1-d3	3.8	/	232.2	70.0	32.0	80
G-H1-13C2	3.4	/	217.1	153.9	18.0	35
MGO	3.55	2,3-DQX	145.0	35.0	28.0	77
GO	3.79	2,3-DQX	131.0	35.0	28.0	77

Supplementary Figure S2. Generation of four specific fluorescent AGEs in WPI co-digested with α -DCs following gastric and subsequent intestinal digestion: (a) vesperlysine, (b) pentosidine, (c) argpyrimidine, (d) crossline. Values represent the mean \pm SD from three independent replicates. AGEs, advanced glycation end-products; WPI, whey protein isolate; α -DC, α -dicarbonyl compounds; GO, glyoxal; MGO, methylglyoxal; (M)GO-L/M/H, WPI co-digested with low, medium, or high nmol of (M)GO, *et cetera*.

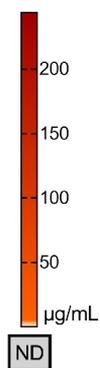


Supplementary Figure S3. Generation of fluorescent AGEs in systems containing α -DCs and enzymes without WPI. AGEs, advanced glycation end-products; WPI, whey protein isolate; α -DC, α -dicarbonyl compounds; GO, glyoxal; MGO, methylglyoxal.



Supplementary Figure S4. Quantification of 10 specific AGEs in WPI co-digested with different α -DCs following GI digestion. Values represent the mean \pm SD from two independent replicates. Different letters indicate statistical difference at $p < 0.05$ (Tukey's test). AGEs, advanced glycation end-products; WPI, whey protein isolate; α -DC, α -dicarbonyl compounds; GO, glyoxal; MGO, methylglyoxal; GO-L/M/H, GO-Low/Medium/High; (M)GO-L/M/H, WPI co-digested with low, medium, or high nmol of (M)GO, *et cetera*; ND, not-detected.

Gastric phase	Control	0.08 \pm 0.0008	0.48 \pm 0.0173	0.18 \pm 0.0119	0.08 \pm 0.0040	0.42 \pm 0.0085	0.08 \pm 0.0024		1.32 \pm 0.0390 g	
	GO-L	0.22 \pm 0.0111	0.52 \pm 0.0094	0.12 \pm 0.0008	0.08 \pm 0.0009	2.22 \pm 0.0202	0.16 \pm 0.0070	0.08 \pm 0.0016	3.40 \pm 0.0494 f	
Intestinal phase	GO-M	0.08 \pm 0.0009	0.28 \pm 0.0023	0.04 \pm 0.0010	0.08 \pm 0.0016	3.90 \pm 0.0260	0.08 \pm 0.0028	0.08 \pm 0.0035	4.54 \pm 0.0337 e	
	GO-H	0.12 \pm 0.0028	0.20 \pm 0.0084	0.46 \pm 0.0087	0.12 \pm 0.0021	0.06 \pm 0.0033	51.3 \pm 0.7128	0.44 \pm 0.0077	52.7 \pm 0.7228 b	
	MGO-L	0.08 \pm 0.0020	3.82 \pm 0.0772	2.80 \pm 0.0630	0.22 \pm 0.0250	1.20 \pm 0.0625		0.08 \pm 0.0024	8.20 \pm 0.2273 d	
	MGO-M	0.18 \pm 0.0055	0.20 \pm 0.0145	10.7 \pm 0.0383	8.62 \pm 0.0206	1.94 \pm 0.0316	0.70 \pm 0.0201	0.08 \pm 0.0024	1.04 \pm 0.0118	23.4 \pm 0.0221 e
	MGO-H	0.80 \pm 0.0064	0.24 \pm 0.0069	22.9 \pm 0.0291	32.4 \pm 0.0237	1.28 \pm 0.0691	1.52 \pm 0.0102	0.06 \pm 0.0138	4.20 \pm 0.0226	63.4 \pm 0.0304 a
	Control	0.28 \pm 0.0028	0.60 \pm 0.0030	0.16 \pm 0.0045	0.08 \pm 0.0031	0.56 \pm 0.0109	0.08 \pm 0.0034			1.76 \pm 0.0285 E
	GO-L	0.04 \pm 0.0001	0.40 \pm 0.0072	0.12 \pm 0.0030		3.68 \pm 0.1576		0.08 \pm 0.0006	4.32 \pm 0.1529 E	
	GO-M	0.08 \pm 0.0016	1.08 \pm 0.0146	0.28 \pm 0.0057	0.06 \pm 0.0031	29.3 \pm 0.6215		0.08 \pm 0.0033	30.9 \pm 0.6409 D	
	GO-H	0.12 \pm 0.0023	0.20 \pm 0.0151	0.46 \pm 0.0186	0.20 \pm 0.0073	0.08 \pm 0.0009	127.5 \pm 3.6098	0.94 \pm 0.0204	0.08 \pm 0.0008	129.5 \pm 3.6751 B
	MGO-L	0.04 \pm 0.0003		2.72 \pm 0.0651	1.98 \pm 0.0201	0.16 \pm 0.0082	1.00 \pm 0.0256		0.12 \pm 0.0024	6.02 \pm 0.0069 E
	MGO-M	0.16 \pm 0.0026	0.36 \pm 0.0155	10.5 \pm 0.0617	7.44 \pm 0.1190	18.5 \pm 0.3461	1.46 \pm 0.0376		0.44 \pm 0.0170	38.9 \pm 0.5984 C
	MGO-H	0.26 \pm 0.0106	0.32 \pm 0.0024	54.1 \pm 0.6629	47.9 \pm 0.7322	133.2 \pm 1.2265	1.20 \pm 0.0111	0.40 \pm 0.0136	6.44 \pm 0.0670	243.7 \pm 2.7262 A
		CML	CEL	MG-H1/3	MG-H2	Argpyrimidine	G-H1	GOLD	MOLD	Total AGEs



ND