

Electronic Supplementary Information (ESI)

Table S1: Gastric pH of emptied couscous digesta during gastric digestion in the HGS. All values represent mean $\pm$ std (n = 3). Significantly different values of each digesta property within the same column (digestion protocol) are represented with different letters (abcd; p < 0.05); significantly different values within the same row (digestion time) are represented by different letters (zyx; p < 0.05).

Time (min)	Gastric pH			
	IR	IS	UC Davis	USP
15	3.54 $\pm$ 0.05 ^{ab,z}	3.45 $\pm$ 0.28 ^{b,z}	1.24 $\pm$ 0.11 ^{b,y}	1.22 $\pm$ 0.04 ^y
30	3.83 $\pm$ 0.03 ^{a,z}	3.88 $\pm$ 0.09 ^{a,z}	1.53 $\pm$ 0.01 ^{a,y}	1.24 $\pm$ 0.01 ^x
60	3.44 $\pm$ 0.08 ^{b,z}	3.19 $\pm$ 0.23 ^{b,z}	1.35 $\pm$ 0.08 ^{b,y}	1.24 $\pm$ 0.01 ^y
90	2.76 $\pm$ 0.06 ^{c,z}	2.23 $\pm$ 0.09 ^{c,y}	1.15 $\pm$ 0.03 ^{c,x}	1.24 $\pm$ 0.03 ^x
120	2.17 $\pm$ 0.03 ^{d,z}	1.76 $\pm$ 0.04 ^{d,y}	1 $\pm$ 0.04 ^{d,x}	1.23 $\pm$ 0.01 ^w
150	1.87 $\pm$ 0.03 ^{e,z}	1.56 $\pm$ 0.12 ^{e,y}	0.92 $\pm$ 0.06 ^{de,x}	1.21 $\pm$ 0.02 ^w
180	1.80 $\pm$ 0.05 ^{e,z}	*	0.89 $\pm$ 0.04 ^{e,y}	1.21 $\pm$ 0.02 ^x

IR: Infogest Riddet; IS: Infogest Semi-dynamic; USP: United States Pharmacopeia.

Table S2: Particle size parameters for particles < 2 mm measured by the Mastersizer. All values represent mean $\pm$ std (n = 3). Significant differences of each digesta property within same column (differences across digestion time) are represented with different letters (abcd; p < 0.05); significantly different values within same row (differences across digestion protocol) are represented by different letters (zyx; p < 0.05).

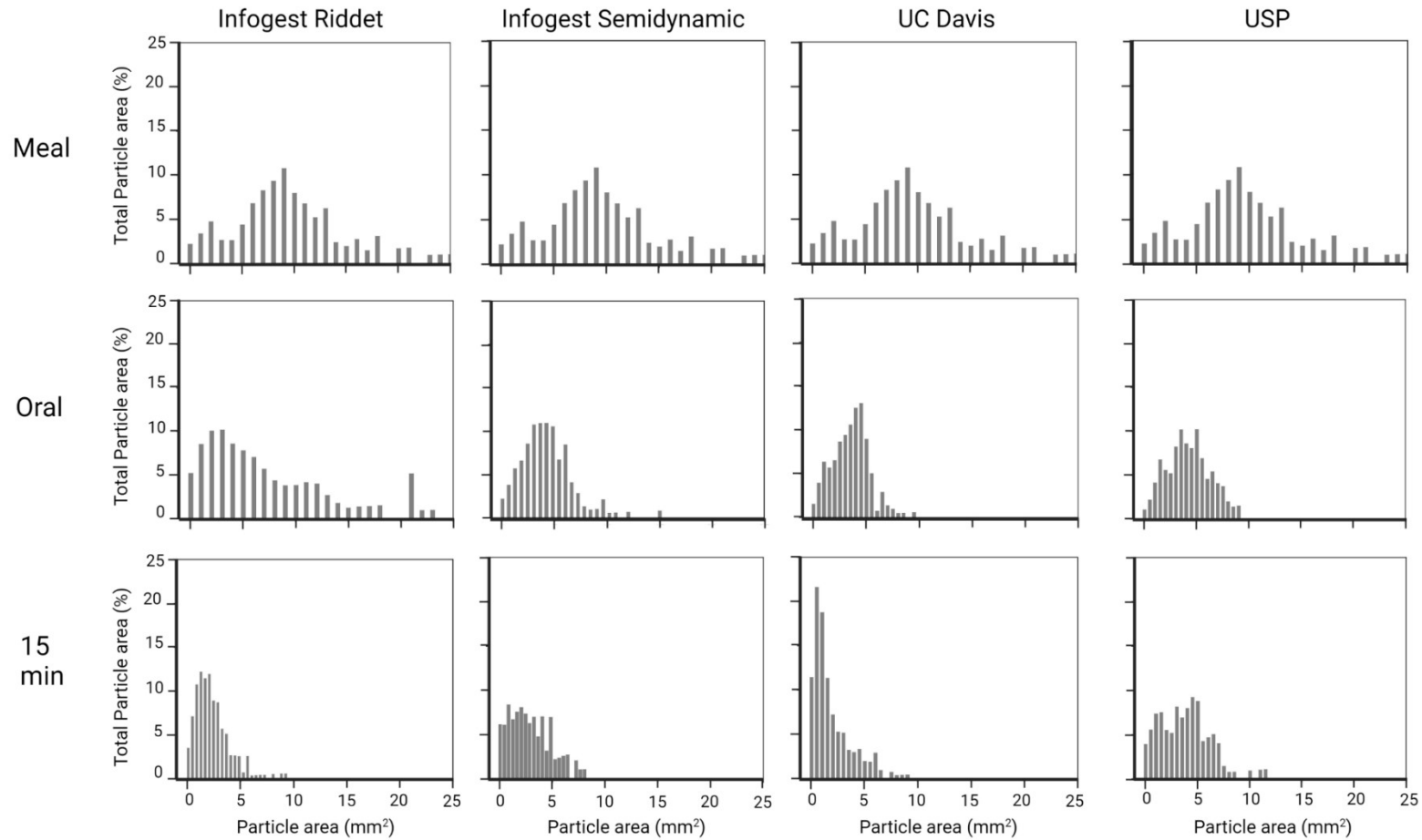
Time	IR	IS	UC Davis	USP
D[4,3] (μm)				
15	54.24 $\pm$ 10.08 ^z	64.2 $\pm$ 3.94 ^{zy}	33.84 $\pm$ 8.05 ^y	38.68 $\pm$ 3.31 ^y
30	56.87 $\pm$ 14.58	80.14 $\pm$ 54.57	43.49 $\pm$ 8.46	39.84 $\pm$ 4.87
60	44.29 $\pm$ 2.66	41.33 $\pm$ 9.95	43.06 $\pm$ 13.55	36.02 $\pm$ 4.65
90	39.13 $\pm$ 1.84	51.32 $\pm$ 8.7	49.98 $\pm$ 15.15	37.76 $\pm$ 7.36
120	42.31 $\pm$ 15.72 ^{zy}	61.33 $\pm$ 21.07 ^z	35.48 $\pm$ 13.06 ^y	38.37 $\pm$ 4.31 ^{zy}
150	54.09 $\pm$ 20.68	61.09 $\pm$ 17.52	39.3 $\pm$ 10.68	37.89 $\pm$ 8.7
180	47.54 $\pm$ 10.74 ^z	*	27.69 $\pm$ 3.45 ^y	42.48 $\pm$ 12.93 ^{zy}
D[3,2] (μm)				
15	21.21 $\pm$ 4.02 ^{ab,z}	15.43 $\pm$ 1.99 ^{ab,y}	16.27 $\pm$ 6.61 ^{a,zy}	22.04 $\pm$ 2.3 ^z
30	21.37 $\pm$ 2.37 ^{a,z}	15.68 $\pm$ 1.12 ^{a,y}	18.03 $\pm$ 1.51 ^{a,zy}	20.94 $\pm$ 3.48 ^z
60	19.11 $\pm$ 2.22 ^{abc,z}	12.28 $\pm$ 2.03 ^{b,y}	17.59 $\pm$ 2.85 ^{ab,z}	19.07 $\pm$ 2.5 ^z
90	16.18 $\pm$ 2.58 ^{c,zy}	12.35 $\pm$ 1.58 ^{ab,y}	17.98 $\pm$ 2.32 ^{a,z}	17.72 $\pm$ 2.21 ^z
120	16.88 $\pm$ 2.14 ^{abc,zy}	13.45 $\pm$ 1.05 ^{ab,y}	15.49 $\pm$ 3.22 ^{ab,zy}	18.02 $\pm$ 0.54 ^z
150	17.2 $\pm$ 1.88 ^{abc,y}	13.45 $\pm$ 1.8 ^{ab,zy}	16.95 $\pm$ 1.86 ^{ab,zy}	17.66 $\pm$ 1.15 ^z
180	16.29 $\pm$ 0.37 ^{bc,zy}	*	13.69 $\pm$ 1.83 ^{b,y}	18.55 $\pm$ 1.01 ^z
d(0.1) (μm)				
15	9.49 $\pm$ 1.78 ^{a,zy}	7.22 $\pm$ 1.09 ^{a,y}	6.98 $\pm$ 2.48 ^{a,zy}	9.85 $\pm$ 1.55 ^z
30	9.18 $\pm$ 1.07 ^a	6.98 $\pm$ 0.5 ^{ab}	7.13 $\pm$ 0.55 ^{ab}	9.04 $\pm$ 2.08 ^{ab}
60	7.83 $\pm$ 0.91 ^{ab,z}	5.26 $\pm$ 0.83 ^{c,y}	7 $\pm$ 0.96 ^{ab,z}	7.91 $\pm$ 1.08 ^{ab,z}
90	6.6 $\pm$ 1.05 ^{b,zy}	5.19 $\pm$ 0.62 ^{c,y}	7.1 $\pm$ 1 ^{ab,z}	7.09 $\pm$ 0.86 ^{b,z}
120	6.78 $\pm$ 0.69 ^b	5.55 $\pm$ 0.44 ^{bc}	6.29 $\pm$ 1.19 ^{ab}	7.23 $\pm$ 0.36 ^b
150	6.84 $\pm$ 0.79 ^b	5.5 $\pm$ 0.57 ^c	6.68 $\pm$ 0.71 ^{ab}	7.08 $\pm$ 0.32 ^b
180	6.49 $\pm$ 0.29 ^{b,zy}	*	5.67 $\pm$ 0.62 ^{b,y}	7.37 $\pm$ 0.3 ^{b,z}
d(0.5) (μm)				
15	35.55 $\pm$ 7.27 ^z	24.17 $\pm$ 3 ^y	26.52 $\pm$ 13.87 ^{a,z}	36.1 $\pm$ 3.05 ^z
30	35.9 $\pm$ 4.41 ^z	26.13 $\pm$ 3.62 ^y	32.74 $\pm$ 3.11 ^{a,zy}	35.59 $\pm$ 4.74 ^z
60	33.37 $\pm$ 4.29 ^z	21.26 $\pm$ 3.95 ^y	31.76 $\pm$ 5.98 ^{ab,z}	32.96 $\pm$ 4.31 ^y
90	28.9 $\pm$ 4.12 ^z	21.16 $\pm$ 2.74 ^y	32.85 $\pm$ 3.09 ^{a,z}	32.07 $\pm$ 3.67 ^y
120	30.29 $\pm$ 4.17 ^{zy}	23.15 $\pm$ 1.73 ^y	27.65 $\pm$ 5.73 ^{ab,zy}	32.23 $\pm$ 1.37 ^z
150	30.9 $\pm$ 2.83 ^z	23.17 $\pm$ 3.5 ^y	31.36 $\pm$ 3.21 ^{ab,z}	31.6 $\pm$ 2.61 ^z

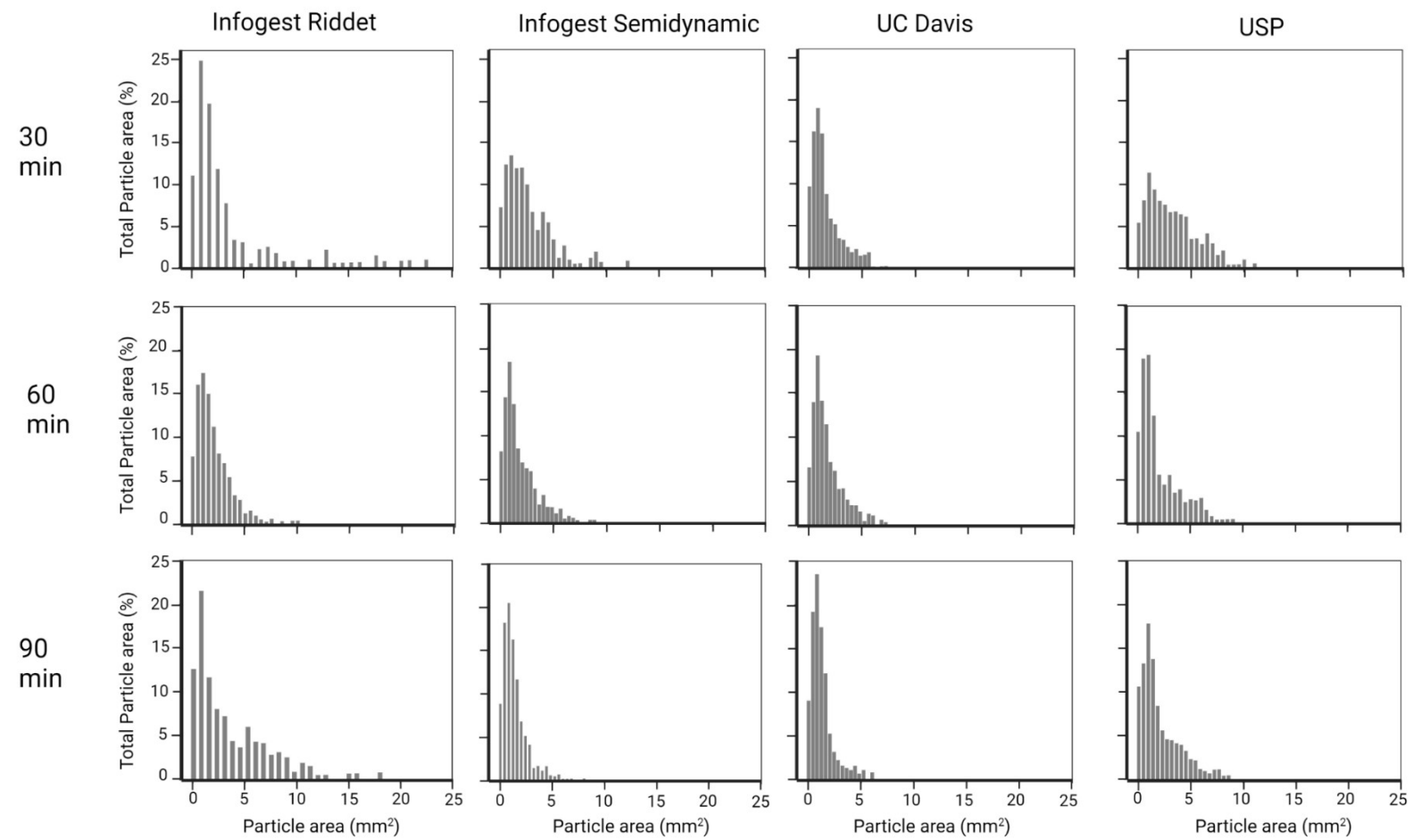
180	29.57 ± 3.5 ^{zy}	*	24.07 ± 4.3 ^{b,y}	33.45 ± 1.95 ^z
d(0.9) (µm)				
15	102.13 ± 30 ^{zy}	135.58 ± 17.12 ^z	63.94 ± 11.62 ^y	69.35 ± 5.12 ^{zy}
30	116.99 ± 60.74	246.59 ± 220.86	79.05 ± 17.27	72.57 ± 6.56
60	82.49 ± 8.81	86.06 ± 44.39	77.34 ± 21.99	67.28 ± 7.81
90	69.26 ± 2.25	90.64 ± 55.25	80.36 ± 10.85	70.7 ± 10.28
120	73.58 ± 17.26 ^{zy}	163.5 ± 111.61 ^z	63.6 ± 12.65 ^y	69.9 ± 6.15 ^{zy}
150	86.83 ± 23.52	153.56 ± 94.19	72.23 ± 13.02	68.02 ± 9.75
180	73.06 ± 12.18	*	55.76 ± 4.88	74.24 ± 14.85

IR: Infogest Riddet; IS: Infogest Semi-dynamic; USP: United States Pharmacopeia.

*Infogest Semidynamic protocol was terminated after 150 min, as there was no digesta samples left in the HGS.

Fig S1: Particle area distribution of couscous digesta at different digestion time. The distribution for each plot represents the sum of the 3 replicates for each treatment and digestion time.





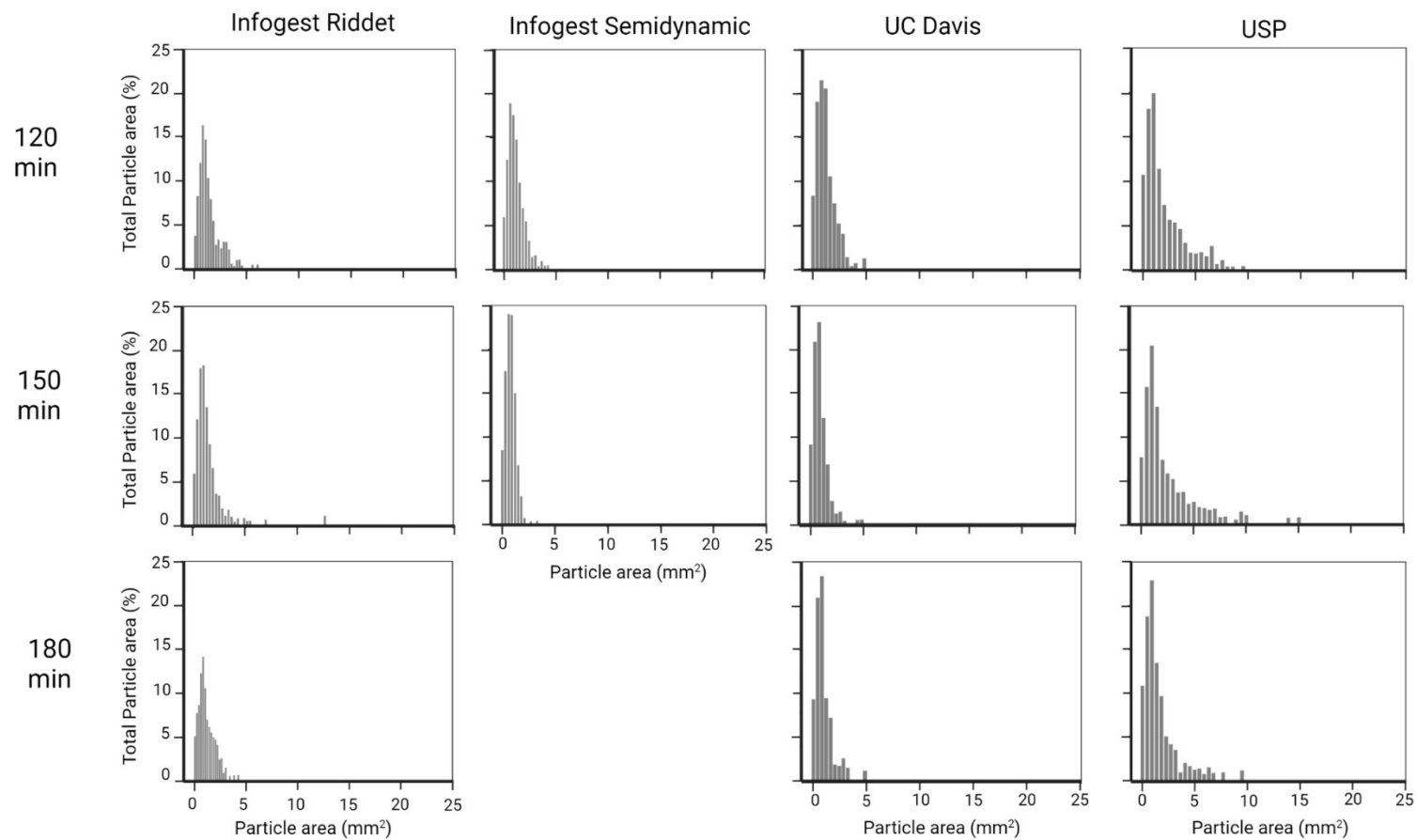


Fig S2: Particle size distribution of digesta samples (particles < 2 mm) emptied at different time for four different digestion protocols (— Infogest Riddet, — Infogest Semidynamic, — UC Davis, — USP), established by averaging the particle size distribution data of three replicates. * Infogest Semidynamic protocol was terminated after 150 min, as there was no digesta samples left in the HGS.

