

Electronic supplementary information

Figure

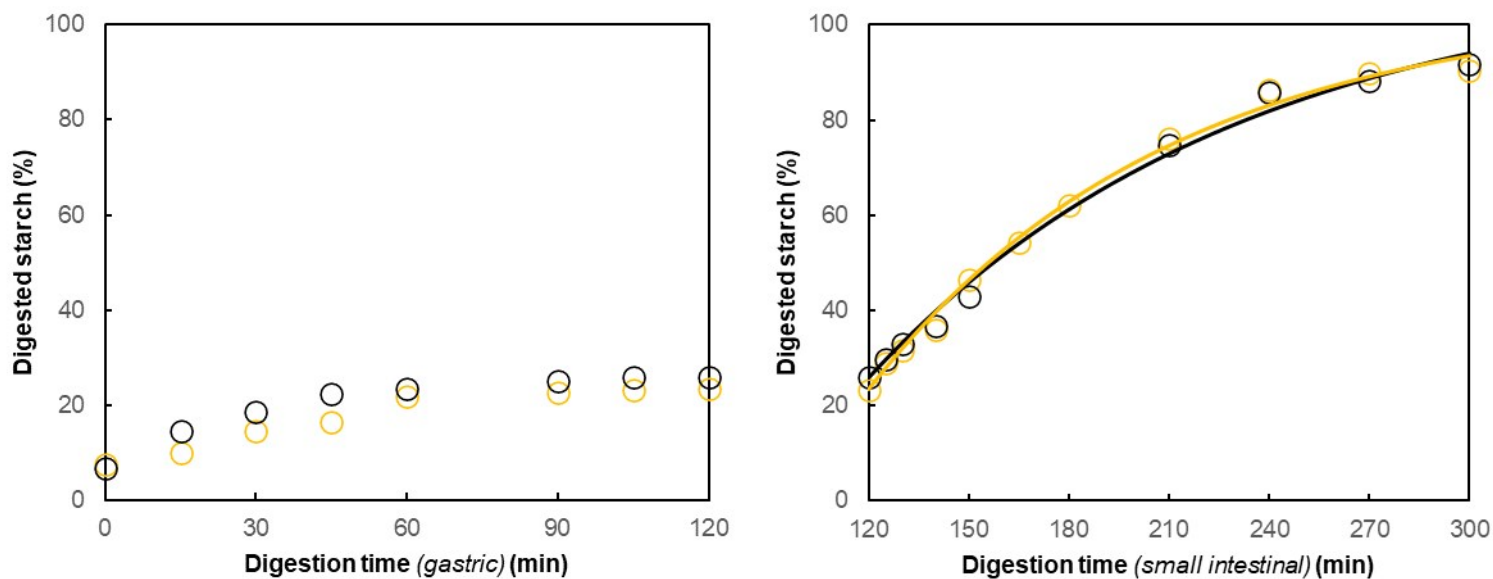


Figure.S1. *In vitro* starch digestion kinetics of individual cotyledon cells from chickpeas during gastric and small intestinal digestion digested with human salivary α -amylase (\circ) and α -amylase from porcine origin coupled to the gradual gastric pH (\circ). Symbols represent experimental values, while lines represent values predicted by fractional conversion model shown (Eq. (6)).

Tables

Table.S1. Estimated kinetic parameters of *in vitro* protein digestion of individual cotyledon cells from chickpeas during gastric and small intestinal digestion with the harmonized INFOGEST protocol (pH 3). Digested protein (%) was evaluated determining the digested soluble protein, readily bioaccessible_{hydrolyzed}, and readily bioaccessible protein fraction. Protein digestion kinetic parameters were estimated by a fractional conversion model (Eq. (6)). Values are estimates \pm standard errors. Mean values (within a column) with different superscript letters are significantly different based on 95% confidence intervals.

Digestion condition	<i>in vitro</i> protein digestion kinetics								
	Readily bioaccessible protein			Readily bioaccessible _{hydrolyzed} protein			Digested soluble protein		
	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}
pH 3 _{gastric phase}	0.021 \pm 0.003 ^a	4.46 \pm 0.28 ^a	0.99	0.046 \pm 0.012 ^a	10.99 \pm 0.71 ^a	0.99	0.028 \pm 0.004 ^a	30.68 \pm 1.24 ^a	0.99
pH 3 _{small intestinal phase}	0.023 \pm 0.004 ^a	32.58 \pm 1.77 ^b	0.99	0.031 \pm 0.002 ^a	67.01 \pm 1.22 ^b	0.99	0.020 \pm 0.003 ^a	85.49 \pm 2.77 ^b	0.99

Table.S2. Estimated kinetic parameters of *in vitro* starch digestion of individual cotyledon cells from chickpeas during gastric and small intestinal digestion digested at different static gastric pH levels pH 2, pH 3 and pH 6. Starch digestion kinetic parameters were estimated by a fractional conversion model (Eq. (6)). Values are estimates \pm standard errors. Mean values (within a column) with different superscript letters are significantly different based on 95% confidence intervals.

Digestion condition	<i>in vitro</i> starch digestion kinetics (small intestinal)			
	k (min ⁻¹)	Starch _{final} (%)	R ² _{adj}	Initial reaction rate (% * min ⁻¹)
pH 2	0.020 \pm 0.001 ^a	79.00 \pm 1.37 ^a	0.99	1.54 \pm 0.08 ^a
pH 3	0.018 \pm 0.001 ^a	68.56 \pm 1.24 ^b	0.99	1.20 \pm 0.06 ^b
pH 6	0.016 \pm 0.002 ^a	65.84 \pm 3.36 ^b	0.99	1.03 \pm 0.14 ^c

Table.S3. Estimated kinetic parameters of *in vitro* protein digestion of individual cotyledon cells from chickpeas during gastric and small intestinal digestion digested at different static gastric pH levels pH 2 and pH 3. Starch and protein digestion kinetic parameters were estimated by a fractional conversion model (Eq. (6)). Values are estimates \pm standard errors. Mean values (within a column) with different superscript letters are significantly different based on 95% confidence intervals.

Digestion condition	<i>in vitro</i> protein digestion kinetics (gastric)							
	Readily bioaccessible protein				Readily bioaccessible _{hydrolyzed} protein			
	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}	Initial reaction rate (% * min ⁻¹)	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}	Initial reaction rate (% * min ⁻¹)
pH 2	0.023 \pm 0.002 ^a	10.58 \pm 0.44 ^a	0.99	0.10 \pm 0.01 ^a	0.038 \pm 0.005 ^a	51.87 \pm 2.30 ^a	0.99	1.95 \pm 0.27 ^a
pH 3	0.021 \pm 0.003 ^a	4.46 \pm 0.28 ^b	0.99	0.25 \pm 0.02 ^b	0.046 \pm 0.012 ^a	10.99 \pm 0.71 ^b	0.99	0.69 \pm 0.19 ^b

Table.S4: Estimated kinetic parameters of *in vitro* protein digestion of individual cotyledon cells from chickpeas during gastric and small intestinal digestion digested at different static gastric pH levels pH 2, pH 3 and pH 6. Protein digestion kinetic parameters were estimated by a fractional conversion model (Eq. (6)). Values are estimates \pm standard errors. Mean values (within a column) with different superscript letters are significantly different based on 95% confidence intervals.

Digestion condition	<i>in vitro</i> protein digestion kinetics (small intestinal)							
	Readily bioaccessible protein				Readily bioaccessible _{hydrolyzed} protein			
	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}	Initial reaction rate (% * min ⁻¹)	k (min ⁻¹)	Protein _{final} (%)	R ² _{adj}	Initial reaction rate (% * min ⁻¹)
pH 2	0.011 \pm 0.001 ^a	38.38 \pm 1.66 ^a	0.99	0.32 \pm 0.04 ^a	0.007 \pm 0.003 ^a	92.92 \pm 12.76 ^a	0.99	0.26 \pm 0.13 ^a
pH 3	0.023 \pm 0.004 ^a	32.58 \pm 1.77 ^a	0.99	0.65 \pm 0.11 ^b	0.031 \pm 0.002 ^b	67.01 \pm 1.22 ^b	0.99	1.70 \pm 0.12 ^b
pH 6	0.012 \pm 0.004 ^a	34.64 \pm 5.27 ^a	0.98	0.41 \pm 0.14 ^c	-	-	-	-