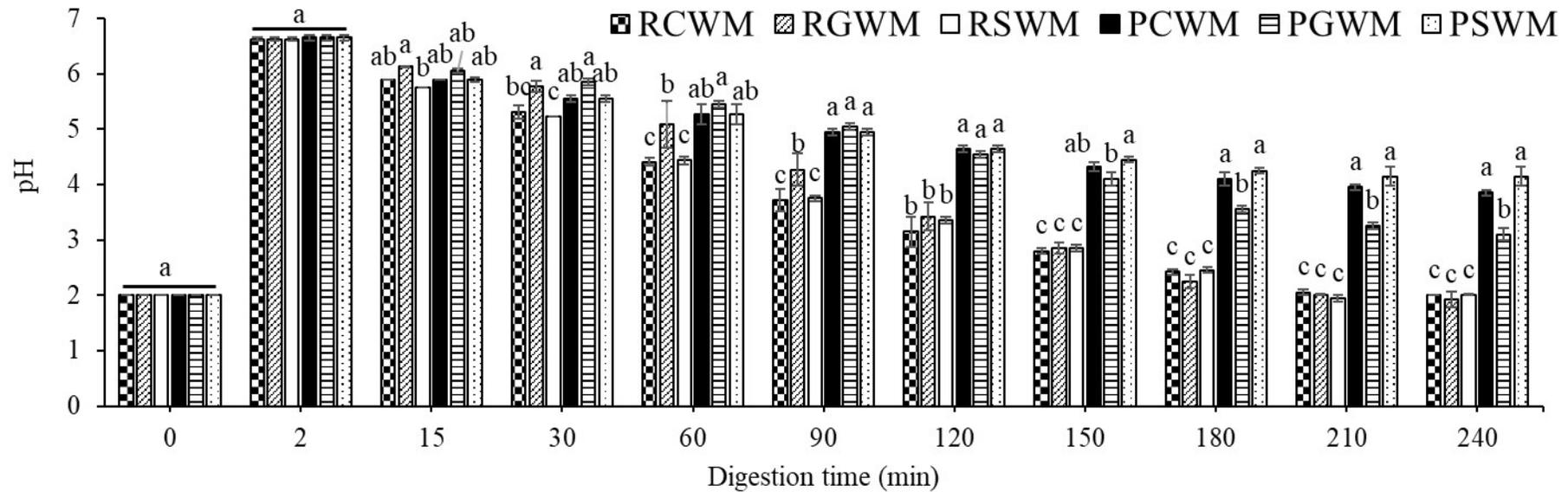


Supplemental Section S1

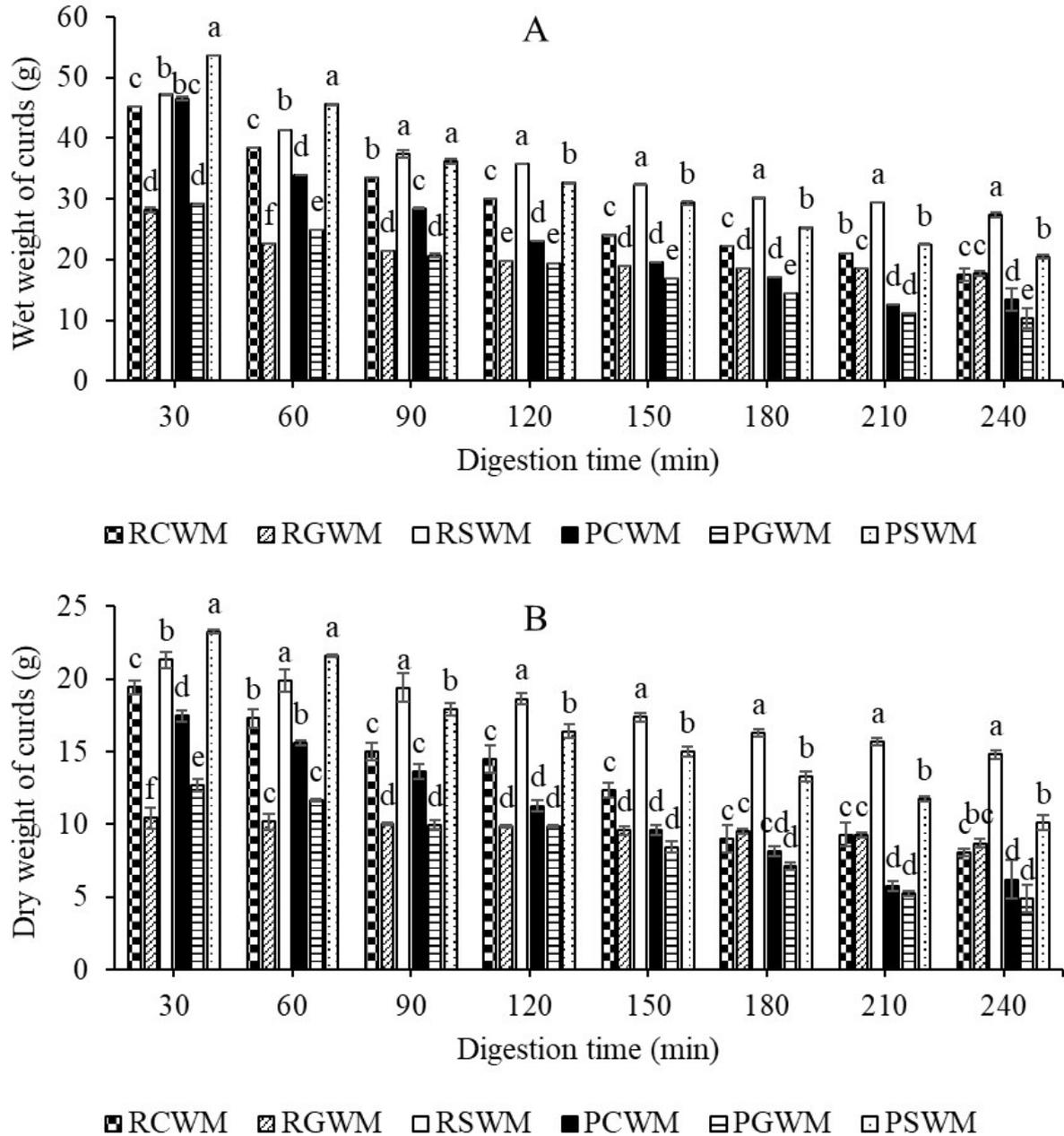
Changes in the intragastric pH

The changes in the pH of the liquid chymes from the raw and pasteurized whole milks of different species as a function of the digestion time in the HGS are shown in Supplemental Fig. S1. The pHs of the raw whole milks of different species were adjusted to achieve a pH of 2 at the end of the 240 min of digestion (i.e., 4 h). As the raw whole milks of the different species varied slightly in buffering capacity, the total amounts of 6 M HCl added to reach pH ~ 2 at the end of 240 min were ~ 4.2, ~ 2.2, and ~ 3.2 mL for the cow, goat, and sheep milks, respectively; such differences were probably due to the differences in protein content, mineral content, and disintegration behavior of the curds formed from the different milks.

The pasteurized whole milks of all species had a slightly slower drop ($P < 0.05$) in pH (especially from 60 min onward) compared with their raw milk counterparts (Supplemental Fig. S1), which indicated that the pasteurized whole milks of the different species would have needed a greater amount of 6 M HCl compared with their respective raw whole milks to drop the pH to 2 during the 4 h of gastric digestion. The relatively slower drop in pH of the pasteurized milks was probably due to their more disintegrated curd structure compared with their raw milk counterparts (as visually observed, Figs. 1 and 2 in the main manuscript), which would have led to more dissolved proteins in the liquid chyme and, thus, a slower decrease in pH.



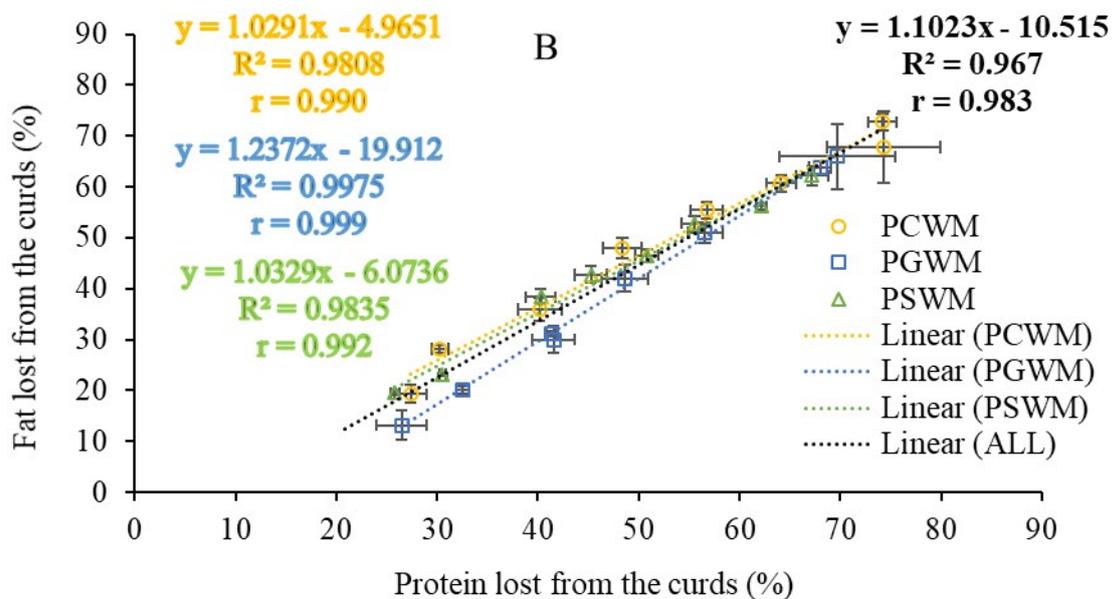
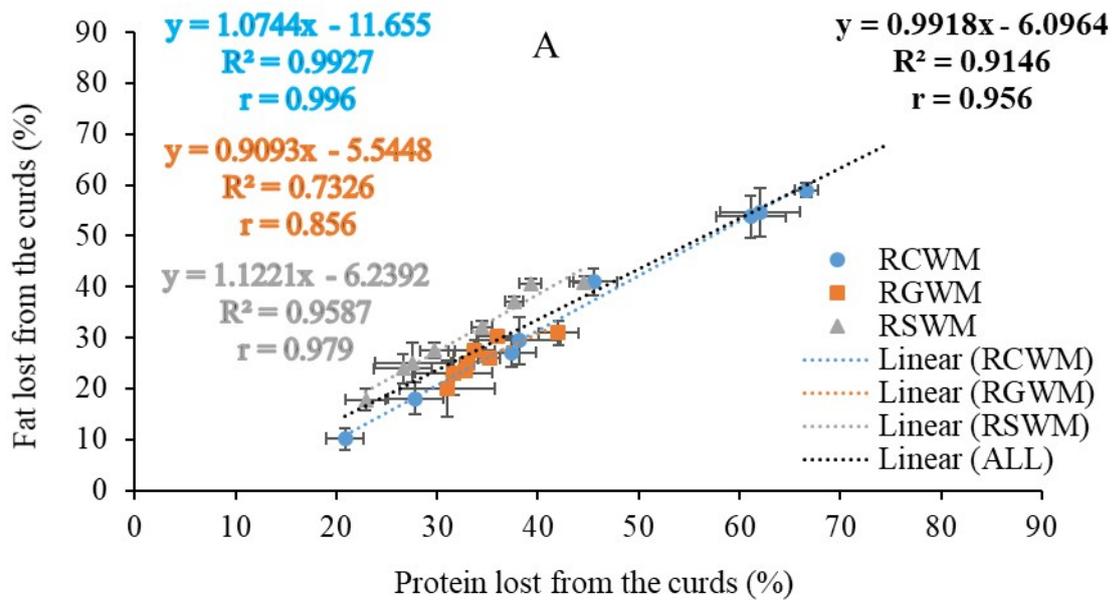
Supplemental Fig. S1 Changes in pH of the liquid chymes from the whole milks during gastric digestion in the HGS (RCWM, raw cow whole milk; RGWM, raw goat whole milk; RSWM, raw sheep whole milk; PCWM, pasteurized cow whole milk; PGWM, pasteurized goat whole milk; PSWM, pasteurized sheep whole milk). Different letters (a–c) above the bars represent significant differences among the milk samples at a given digestion timepoint ($P < 0.05$); differences within a particular milk sample across different digestion times are not represented. Each data point represents the mean \pm SD of results from at least two different batches of milk.



Supplemental Fig. S2 Changes in the weight of the curds produced during the gastric digestion of 200 g of different milks in the HGS: (A) wet weights of the curds; (B) dry weights of the curds. RCWM, raw cow whole milk; RGWM, raw goat whole milk; RSWM, raw sheep whole milk; PCWM, pasteurized cow whole milk; PGWM, pasteurized goat whole milk; PSWM, pasteurized sheep whole milk. Different letters (a–f) above the bars represent significant differences among the milk samples at a given digestion timepoint ($P < 0.05$); differences within a particular milk sample across different digestion times are not represented. Each data point represents the mean \pm SD of results from at least two different batches of milk.

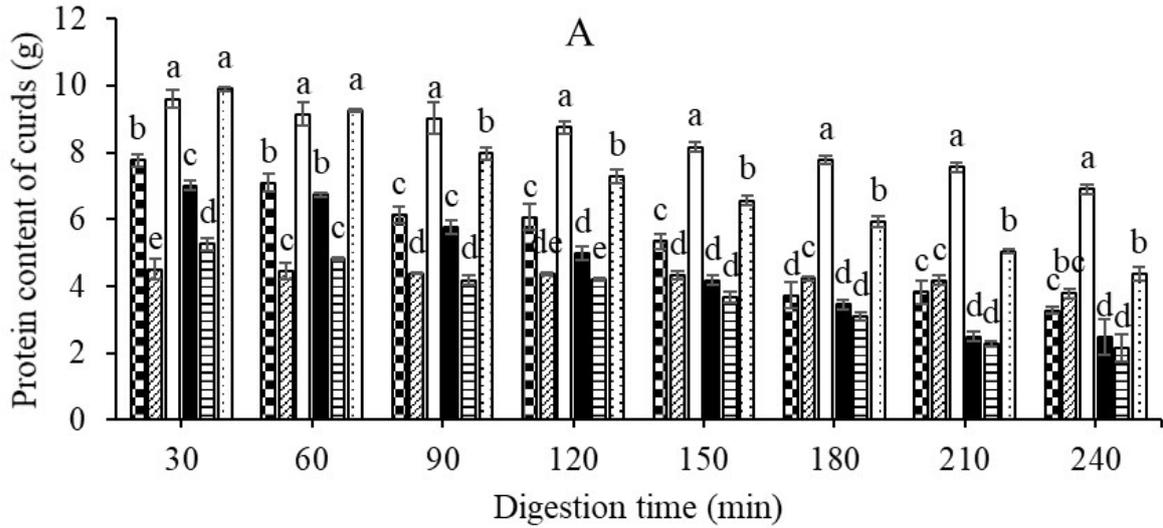
Supplemental Table S1 Fat globule sizes (μm) of the liquid chymes from the whole milks of different species at different digestion times (RCWM, raw cow whole milk; RGWM, raw goat whole milk; RSWM, raw sheep whole milk; PCWM, pasteurized cow whole milk; PGWM, pasteurized goat whole milk; PSWM, pasteurized sheep whole milk). Values are reported as the mean \pm SD of results from at least two different batches of milk. Values with different superscripts (A–D) represent significant differences among the samples ($P < 0.05$).

Fat globule size (μm)	Milk	Digestion time (min)			
		0 min (before digestion)	30 min	90 min	240 min
D_{43} (volume weighted mean diameter)	RCWM	4.26 ± 0.02^C	4.37 ± 0.00^C	4.44 ± 0.00^C	6.27 ± 1.10^C
	RGWM	3.83 ± 0.07^C	7.44 ± 4.21^{BC}	8.52 ± 5.4^{BC}	13.65 ± 10.81^{ABC}
	RSWM	4.09 ± 0.01^{ABC}	14.39 ± 10.72^C	21.88 ± 8.74^{AB}	12.21 ± 7.33^{ABC}
	PCWM	4.40 ± 0.08^C	4.48 ± 0.00^C	4.56 ± 0.05^C	6.89 ± 1.40^C
	PGWM	3.85 ± 0.00^C	6.81 ± 0.39^{BC}	12.99 ± 0.49^{ABC}	10.99 ± 7.85^{ABC}
	PSWM	4.10 ± 0.01^C	21.45 ± 10.08^A	5.31 ± 2.73^C	6.63 ± 2.32^{BC}
D_{32} (surface weighted mean diameter)	RCWM	3.59 ± 0.03^{ABCD}	3.66 ± 0.00^{ABCD}	3.71 ± 0.00^{ABCD}	3.78 ± 0.04^{ABCD}
	RGWM	3.00 ± 0.05^D	2.98 ± 0.15^D	3.05 ± 0.22^{CD}	4.28 ± 1.37^{AB}
	RSWM	3.50 ± 0.00^{ABCD}	4.05 ± 0.67^{ABCD}	4.82 ± 0.69^A	3.95 ± 0.45^{ABCD}
	PCWM	3.65 ± 0.07^{ABCD}	3.73 ± 0.00^{ABCD}	3.67 ± 0.02^{ABCD}	3.94 ± 0.04^{ABCD}
	PGWM	2.98 ± 0.00^{BCD}	3.20 ± 0.16^{BCD}	3.36 ± 0.04^{ABCD}	4.22 ± 0.61^{ABC}
	PSWM	3.50 ± 0.00^{ABCD}	4.48 ± 0.06^A	3.59 ± 0.12^{ABCD}	3.63 ± 0.20^{ABCD}

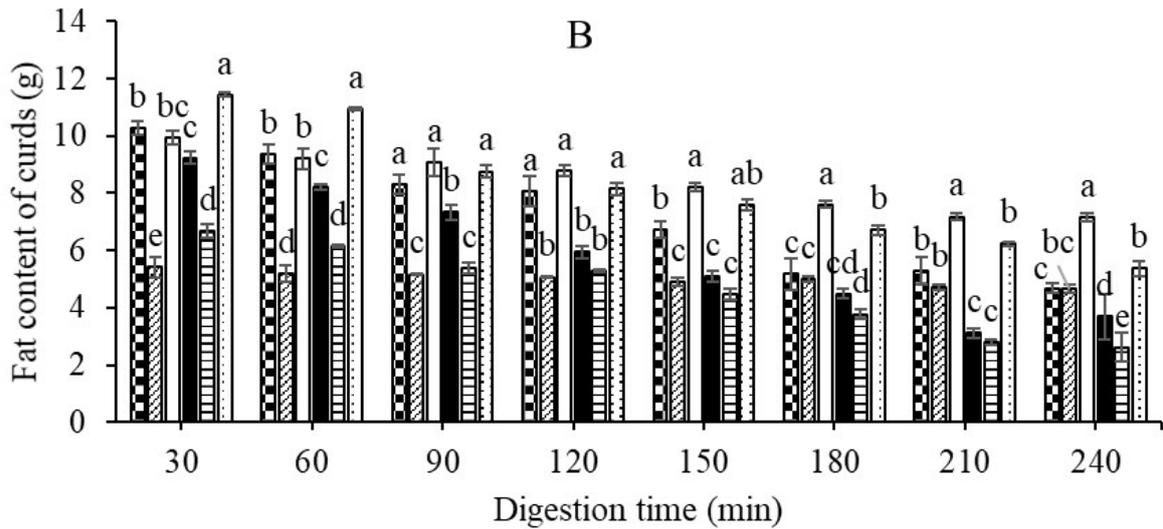


Sup

Supplemental Fig. S3 Relationship between the fat and protein contents lost from the curds of different whole milks during gastric digestion in the HGS from 30 to 240 min: (A) raw whole milk curds; (B) pasteurized whole milk curds (RCWM, raw cow whole milk; RGWM, raw goat whole milk; RSWM, raw sheep whole milk; PCWM, pasteurized cow whole milk; PGWM, pasteurized goat whole milk; PSWM, pasteurized sheep whole milk). Each data point represents the mean \pm SD of results from at least two different batches of milk. The Pearson correlation coefficient value (r) ($P < 0.05$) as well as the regression line and the equation for each milk and the overall graph are depicted.



■ RCWM ▨ RGWM □ RSWM ■ PCWM ▨ PGWM ▨ PSWM

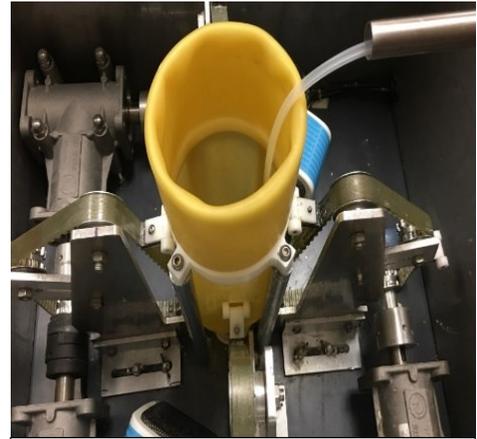


■ RCWM ▨ RGWM □ RSWM ■ PCWM ▨ PGWM ▨ PSWM

Supplemental Fig. S4 Changes in the protein and fat contents of the curds during the gastric digestion of 200 g of different milks in the HGS: (A) protein content of the curds; (B) fat content of the curds. RCWM, raw cow whole milk; RGWM, raw goat whole milk; RSWM, raw sheep whole milk; PCWM, pasteurized cow whole milk; PGWM, pasteurized goat whole milk; PSWM, pasteurized sheep whole milk. Different letters (a–e) above the bars represent significant differences among the milk samples at a given digestion timepoint ($P < 0.05$); differences within a particular milk sample across different digestion times are not represented. Each data point represents the mean \pm SD of results from at least two different batches of milk.



Setting up of the HGS.



Picture of the internal compartment of the HGS.



Internal chamber of the latex stomach before adding milk and SGF (Simulated Gastric fluid).



Signs of milk coagulation few minutes after starting gastric digestion.



An example of the separated curd and liquid phase inside the HGS.

Supplemental Fig. S5 Photographs of the Human Gastric Simulator (HGS).