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Supporting Information for

2 **Fate of Hydroxyapatite Nanoparticles during Dynamic in vitro**

3 **Gastrointestinal Digestion: The Impact of Milk as a Matrix**

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5 **Kinley Choki,¹ Siqu Li,¹ Aiqian Ye,^{1*} Geoffrey B. Jameson,^{1,2} and Harjinder Singh¹**

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7 ¹ Riddet Institute, Massey University, Private Bag 11 222, Palmerston North 4442, New

8 Zealand

9 ² School of Fundamental Sciences, Massey University, Private Bag 11 222, Palmerston North

10 4442, New Zealand

11 Dissolution calculation

12 Dissolution of nHA in nHA_{blank}:

$$13 \quad D_{t_1-2} = \frac{m_{t_2} - m_{\text{carryover } t_1}}{m_{\text{total}}} \times 100\%$$

$$14 \quad m_{t_2} = (C_{\text{HA blank } t_2} - C_{\text{SGF } t_2}) \times V_{t_2} \times M$$

$$15 \quad m_{\text{carryover } t_1} = (C_{\text{HA blank } t_1} - C_{\text{SGF } t_1}) \times V'_{t_1} \times M$$

16 Dissolution of nHA in nHA_{milk}:

$$17 \quad D_{t_1-2} = \frac{m_{t_2} - m_{\text{carryover } t_1}}{m_{\text{total}}} \times 100\%$$

$$18 \quad m_{t_2} = (C_{\text{HA milk } t_2} - C_{\text{milk blank } t_2}) \times V_{t_2} \times M$$

$$19 \quad m_{\text{carryover } t_1} = (C_{\text{HA milk } t_1} - C_{\text{milk blank } t_1}) \times V'_{t_1} \times M$$

20 where:

21 t – digestion time

22 D_{t_1-2} – dissolution of HA between times t_1 and t_2 as a percentage of total HA added

23 m_t – weight of calcium dissolved from HA at time t

24 $m_{\text{carryover } t}$ – weight of carryover calcium dissolved from HA at time t

25 C_t – ionic calcium concentration at time t

26 V_t – volume of digesta at time t (before sampling)

27 V'_t – volume of digesta at time t (after sampling)

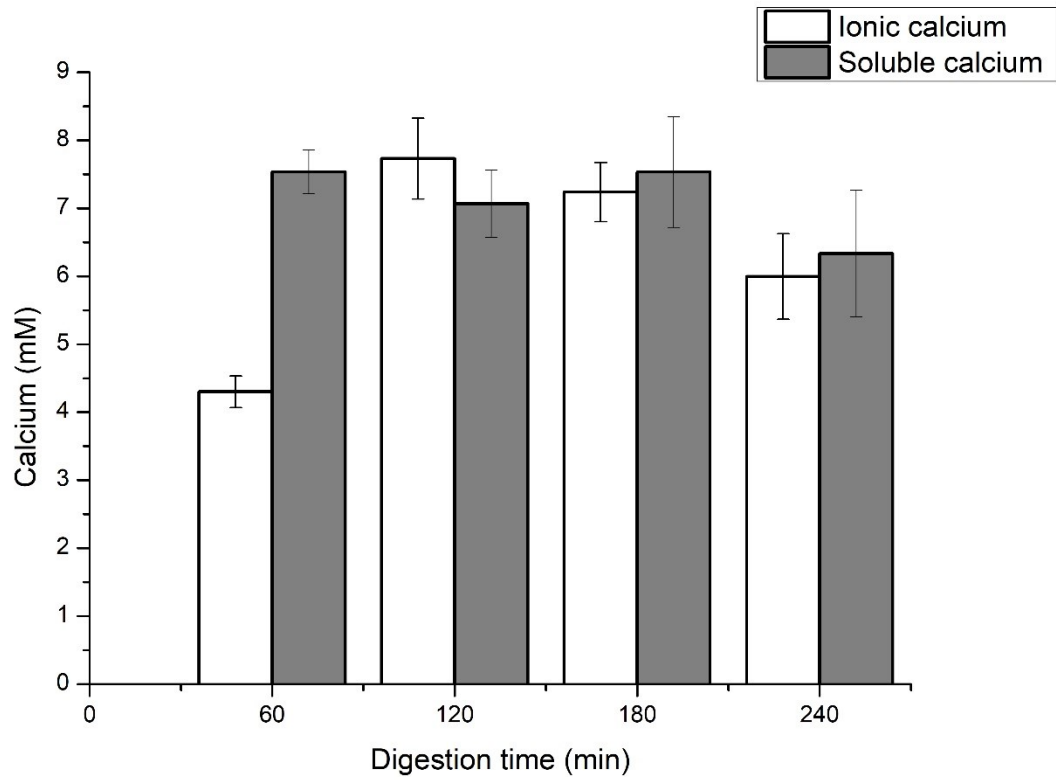
28 M – molecular mass of calcium

29 m_{total} – weight of total calcium in added HA

30 **Table S1. Buffering capacity of nHA dispersion (420 mg in 250 mL MilliQ water)**

pH range	Buffering capacity (dB/dpH)
6.4-6.9	0.0006
5.4-6.4	0.0028
5.0-5.4	0.0100
4.5-5.0	0.0210
4.0-4.5	0.0086
3.4-4.0	0.0034
3.1-3.4	0.0058
2.6-3.1	0.0084

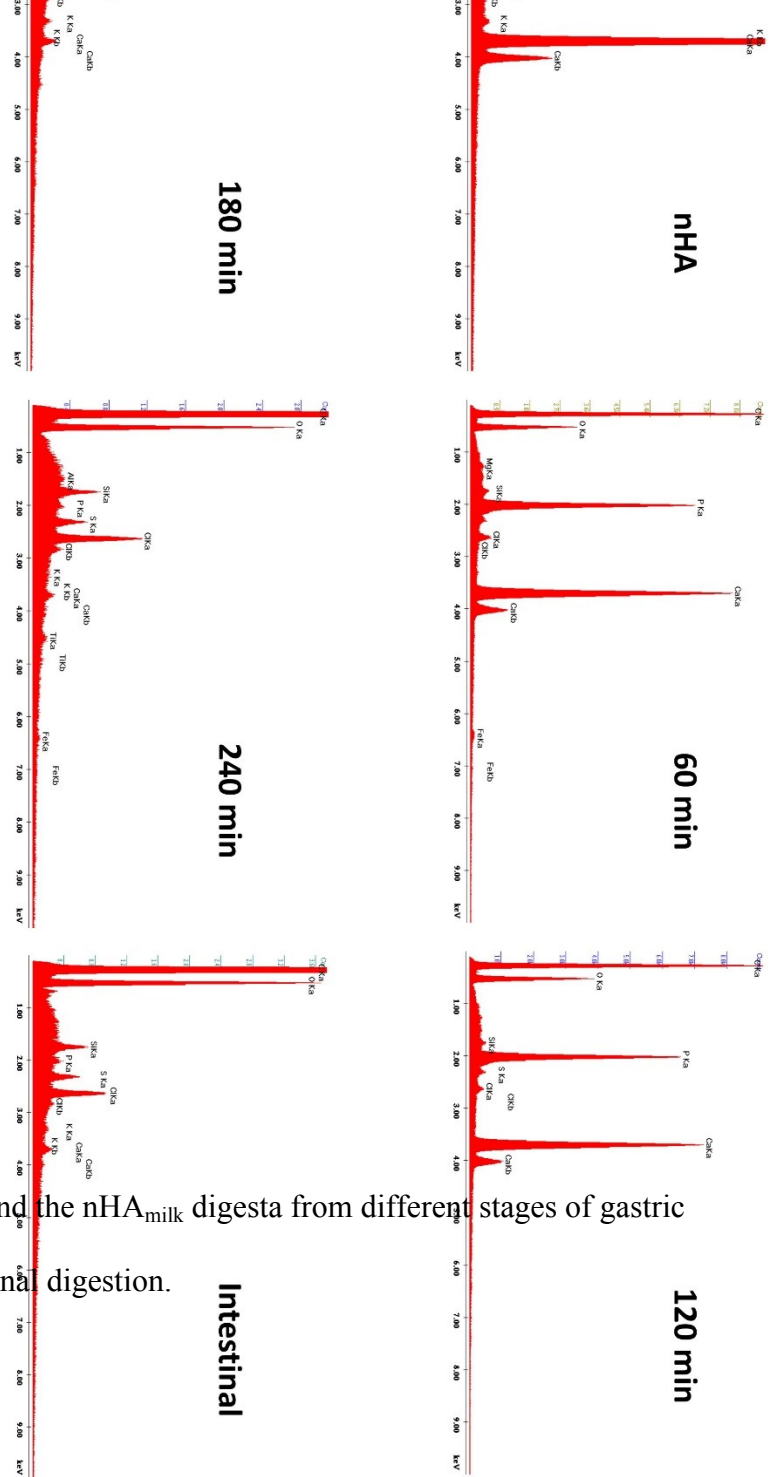
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33 **Figure S1.** Ionic calcium and soluble calcium concentrations of nHA_{milk} digesta at different
34 gastric digestion times.

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37 **Figure S2.** EDS graphs of nHA and the nHA_{milk} digesta from different stages of gastric
 38 digestion and by the end of intestinal digestion.