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The impact of human milk pasteurization is lower on the preterm than on the term milk digestion

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Mother's own milk is the ideal infant food for optimal nutrition and growth. When not available, pasteurized donor milk can be administered. Pasteurization has structural and biochemical consequences on term milk digestion^{1,2}. Whether similar results would be observed for preterm milk remains unknown and was thus the aim of our study.

An *in vitro* dynamic system was used to simulate digestion. Preterm human milk (n = 5 donors) was digested using preterm infant digestive parameters while for term milk (n = 5 donors), term infant digestive parameters were employed^{3,4}. Each type of milk was digested as raw or pasteurized (62.5°C, 30 min) in triplicate. Digesta were sampled regularly in the gastric compartment (over 90 or 120 min for preterm or term milk, respectively) and over 180 min in the intestinal compartment. Structural changes were evaluated by confocal microscopy and laser light scattering. Proteolysis was followed by SDS-PAGE submitted to densitometry and by quantitative peptide analysis using tandem mass spectrometry coupled to liquid

chromatography. Lipolysis was evaluated by gas chromatography and thin layer chromatography fitted to flame ionisation detector.

Lipolysis degree was in overall significantly lower in pasteurized than in raw milk in both preterm and term conditions, but the extent of the difference was lower for the preterm than for the term condition. Gastric proteolysis was somewhat lower in the preterm than in the term milk. The impact of pasteurization on gastric proteolysis differed according to the protein structure with β -casein being hydrolysed significantly slower and lactoferrin being hydrolysed significantly faster in term pasteurized milk compared to term raw milk. This was not statistically significant in preterm milk. Similarly, the peptidome differed between raw and pasteurized milk to a lesser extent in the preterm than in the term condition. In both preterm and term conditions, pasteurization impacted the protein susceptibility to aggregation during digestion.

These results demonstrate that pasteurization had a lower impact on digestion of preterm milk compared to term milk. Such results have to be confirmed by *in vivo* studies.

References:

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³ Bourlieu C., et al. (2014). *Crit Rev Food Sci Nutr*, 54(11), 1427-57.

⁴ Ménard O., et al. (2014). *Food Chem*, 145, 1039-45.

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