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Title:

Food matrix effects on protein digestibility of liquid and solid dairy foods using an *in-vitro* gastrointestinal model for weaning infants

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text into it.)

Preparation of Your Abstract

1. The title should be as brief as possible but long enough to indicate clearly the nature of the study. Capitalise the first letter of the first word ONLY (place names excluded). No full stop at the end.
2. Abstracts should state briefly and clearly the purpose, methods, results and conclusions of the work.

Introduction: Clearly state the purpose of the abstract

Methods: Describe your selection of observations or experimental subjects clearly

Results: Present your results in a logical sequence

Discussion: Emphasize new and important aspects of the study and conclusions that are drawn from them

Background: The digestibility of milk is well characterised for infants. However, little is known about the effect of food structure on nutrient bioaccessibility at the time of weaning.

Method: Reconstituted skim bovine milk was selected to prepare four matrices, namely skim milk control (SM), heated skim milk (HM), rennet-induced milk gel (RG) and starch-induced milk gel (SG) with 5% (w/w) protein content. The matrices were characterised for apparent viscosity and digested by three digestion models, including a weaning infant in-vitro model (WI), an adult (A) INFOGEST in-vitro model1 and an infant (I) in-vitro model2. The weaning infant (WI) model was specially developed based on known physiological changes that occur at weaning and used to simulate digestion for all samples. Resulted digesta from all models was analysed for protein digestibility by SDS-PAGE, degree of hydrolysis (DH) by OPA and peptidomics by LC-MS/MS. Obtained results were compared between models and matrices.

Results: Food structure influenced digestibility under simulated WI conditions, with notable differences between the two liquid milk (SM, HM) and the two solid gel (RG, SG) matrices during gastric digestion. Moreover, the food matrix was shown to influence DH under intestinal conditions with higher levels in RG compared to HM from 30 min onwards

Conclusion: The food matrix affected protein digestibility for liquid and gelled bovine skim milk matrices. Moreover, protein digestibility for both liquid milk and gels digested under WI simulated gastric conditions is different to those digested under I or A conditions in the order of A > WI > I. Differences in the matrices' peptidome profile were also noted between digestion models. However, limited differences were measured in digestibility between matrices under intestinal conditions regardless of the model applied, yet differences in the peptidome profile remained. This indicates that weaning infants exhibit unique digestive patterns compared to infant or adults, exhibiting differences in protein digestibility under gastric conditions and differences in the breakdown of proteins to form peptides across both gastric and intestinal digestion.

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2. Ménard, O., Bourlieu, C., De Oliveira, S. C., Dellarosa, N., Laghi, L., Carrière, F., Capozzi, F., Dupont, D., & Deglaire, A. (2018). A first step towards a consensus static in vitro model for simulating full-term infant digestion. Food Chemistry, 240, 338–345. Q1. https://doi.org/10.1016/j.foodchem.2017.07.145