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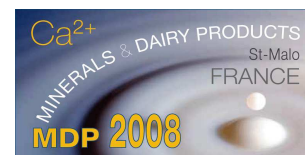
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Preparation of partially dephosphorylated bovine β -casein, a model for the human homologous protein

Aurélié Matéos, Jean-Michel Girardet, Fateh Bouzobra, Laurent Miclo, Jean-Luc Gaillard

Unité de Recherche Animal et Fonctionnalités des Produits Animaux (UR AFPA) – Equipe Protéolyse et Biofonctionnalité des Protéines et des Peptides (PB2P), Nancy-Université, U.C. INRA 340, 54506 Vandœuvre-lès-Nancy, France

amateos@uhp-nancy.fr and mateosaurelie@yahoo.fr

Human β -casein displays variable degrees of phosphorylation with a maximum of five (5P) phosphate groups. The 2P and 4P isoforms are the major components of this β -casein. It is, however, difficult to study the ability of the different human β -casein variants to bind minerals of nutritional interest due to their low availability. The bovine β -casein, available in high amount, is fully phosphorylated on its five potential phosphorylation sites and seems therefore to be a bad candidate to study the influence of the levels and positions of phosphorylation. However, an experimental approach allowing using the bovine protein was proposed. It consisted to prepare bovine β -casein partially dephosphorylated by alkaline phosphatase, an enzyme that generated all of the possible phosphorylation isoforms, *i.e.*, from 0P to 5P. The latter were characterized by electrophoresis in the presence of urea and by two-dimensional electrophoresis. The respective apparent isoelectric points of the different partially dephosphorylated bovine β -casein were determined. Theoretical isoelectric points were calculated according to the degree of phosphorylation and to the β -casein genetic variant, *i.e.*, the A1 or A2. These isoelectric points were compared to the experimental ones and spots were attributed to an isoform (values ranged from 4.65 to 5.24). It will be necessary to identify the kind of isoforms generated by alkaline phosphatase. For example, is there a population of 4P isoforms or only one major form generated? Such a model might be useful to understand the influence of the degree and the sequence of phosphorylation on the binding of minerals by caseins and to identify if some caseinophosphopeptide variants might enhance the bioavailability of minerals in the gastrointestinal tract.