

Characterisation of African elephant beta casein and its relevance to the chemistry of caseins and casein micelles

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ABSTRACT:

Caseins in milk exist as casein micelles, the structure of which is unclear. The combination of all four casein types, together with calcium phosphate clusters, are believed to be important for the stabilisation of casein micelle structure. In African elephant milk, only two major caseins, β - and κ -casein, have been identified, with β -casein forming the greater part, similar to human milk. African elephant β -casein was purified and identified as five isomers with different isoelectric points. A single β -casein isoform in its equal unphosphorylated and singly phosphorylated forms at Ser 9 was characterised. This phosphoprotein seems to be a major β -casein variant with an internal truncation of the peptide sequence ESVTQV NK encoded by exon 5, resulting in a variant with 200 amino acid residues. The other minor β -casein isoforms are possibly different splice variants of exons 3 and 4. This combination of proteins may provide additional insight into casein micelle structure.