



Comparative adsorption studies of proteose peptone component 3 on some hydrophobic interaction supports

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Proteose-peptone (PP) is a heat-stable and acid-soluble protein fraction of bovine and caprine milk that can be separated into two groups: the first one is a complex mixture of protein hydrolysates, mainly resulting from proteolysis of caseins and the second group comprises a phosphorylated hydrophobic glycoprotein portion called component 3 (PP3). Early studies have suggested that PP3 occurs in milk as a 163 kDa multimeric aggregate of 22 kDa monomers.

Moreover, the total proteose-peptone fraction is already of great interest because of its functional properties and several authors report that the PP3 is probably the source of these properties. Several functions have been suggested and investigated for bovine PP3, including very stable emulsifying properties, inhibition of lipolysis and mitogenesis, however the exact function of PP3 in vivo is still unresolved. In the light of these considerations, recover using aqueous two-phase systems, gel filtration and anion exchange chromatography has been performed and optimized for the capture of this extremely hydrophobic component from the total proteose peptone fraction. Hydrophobic interaction chromatography (HIC) is a powerful methodology commonly used in modern biotechnology for the downstream processing of several biomolecules, but it is not often described for the isolation of PP3. Therefore, the main scope of this work is the evaluation and potential application of HIC in the isolation of PP3 from the total proteose peptone fraction of bovine milk.

A comparative study on the interaction of PP3 with some hydrophobic adsorbents (Butyl-, Octyl-, Phenyl-, "Epoxy"-Sephacrose), was developed. The four adsorbents were evaluated in terms of selectivity, recovery and fractionation of PP3 from the protein concentrate extract. A comparison between the chromatographic profiles obtained at different concentrations of ammonium sulphate with the total proteose peptone fraction on the different HIC adsorbents mentioned above was performed and evaluated.