

PURIFICATION AND THERMAL DENATURATION KINETICS OF SERUM ALBUMIN IN BACTRIAN CAMEL MILK

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ABSTRACT

Serum albumin is a non-specific transporter protein. It is the 2nd most abundant whey protein present in camel milk, with significantly higher content than in milk from other animals. In this study, we isolated and purified camel serum albumin (CSA) from milk by DEAE-Sepharose FF and Sephacryl S-100 gel filtration chromatography and checked its purity by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and ultra-performance liquid chromatography (UPLC). The main band of the purified product on SDS-PAGE corresponded with the location of a bovine serum albumin standard. In UPLC, the purified product presented a single sharp peak, which indicated it was a homogenous preparation. Amino acid sequence analysis of the purified protein confirmed it was CSA. Subsequently, we analysed the thermal denaturation of CSA from 70 to 95°C for 10, 20, 30, 40 and 50 min. CSA had upper stability under 75°C, the residual rate range over 70.25% to 87.12%. The degree of denaturation increased with temperature and time, but small range of fluctuations between denaturation rate. The residual rate of CSA, heated 10 min at 95°C, was about 58.34%. After CSA was heated 50 min at 95°C, it was not entirely denatured. These results suggested that CSA could maintain high stability in dairy products treated by low-temperature long-time or high-temperature short-time heating treatment and the reaction order of heat denaturation was 1.9. This study provides reference and application data for further research on CSA.

Key words: Bactrian camel milk, purification, serum albumin, thermal denaturation, thermal kinetic analysis