

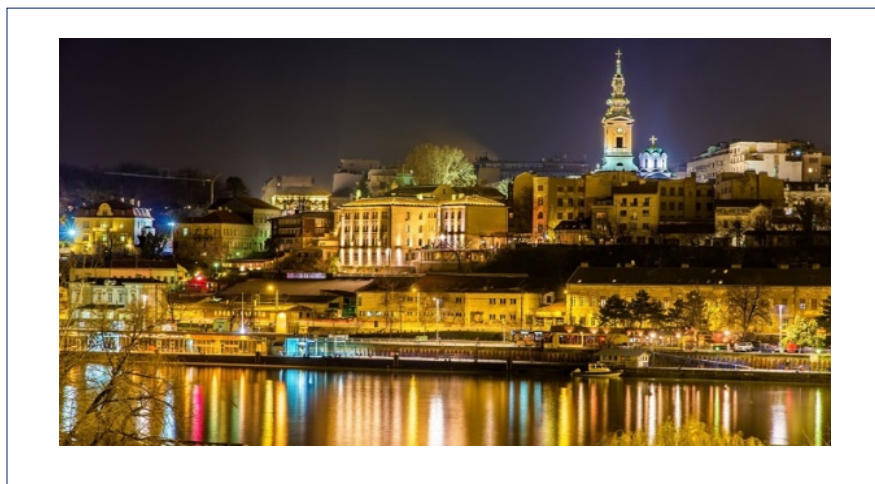


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Physicochemical characterization of soluble proteins of whole camel milk powders produced by spray drying treatment at high temperatures

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Objective. Camel milk is highly nutritious food with numerous health benefits proposed. Demand for camel milk has increased worldwide. Production of camel milk powders facilitate its transport, prolonge shelf-life, and also offer an attractive additive for various food products. In this study we characterized proteins of soluble fraction of freeze/spray dried camel milk powders.

Material and Methods. Whole camel milk powders were prepared by spray drying treatment at six different inlet temperatures (190°C - 250°C) or by freeze drying. The soluble protein fractions upon the treatments were analysed by combination of electrophoretic and spectroscopic techniques. Functional properties, such as antioxidant activity and protein solubility were assessed.

Results. SDS-PAGE revealed non-uniform increase in Mw of major protein bands, while native electrophoresis revealed non-uniform decrease in pI values with increased inlet temperature of spray drying. That indicated attachment of lactose moieties to NH₂-group of proteins via non-enzymatic Maillard reaction. Spectrophotometric analysis showed formation of intermediate Maillard reaction products (increased absorbance at 294 nm) and no detectable late Maillard reaction products formation. Far-UV circular dichroism spectra showed no differences in secondary structures between freeze and spray dried samples. Antioxidant activity and protein solubility were increased with increase in inlet temperature.

Conclusions. Our results showed that spray drying treatment promoted non-enzymatic glycation of camel milk proteins. Glycation of food proteins affects their techno-functional properties, shelf-life and nutritional value. Thus, optimization of spray drying parameters is essential for production of high quality camel milk powders.

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