

Physicochemical and antioxidant properties of freeze-dried dromedary skim colostrum and milk powder

Olfa Oussaief^{1*}, Zeineb Jrad¹, Mohamed Dbara¹,
Touhami Khorchani¹, Halima El Hatmi^{1,2}

¹University of Gabes, Livestock and Wildlife Laboratory, Arid Lands Institute of Medenine, 4119 Medenine, Tunisia

²University of Gabes, Department of Food, High Institute of Applied Biology of Medenine, 4119 Medenine, Tunisia

*Corresponding author: olfa.loussaief@hotmail.fr

Abstract

This study aimed to determine the physicochemical properties and antioxidant activities of dromedary skim colostrum and milk powder produced by freeze-drying. Results of the study showed that skim colostrum powder possessed higher protein content compared to milk powder whereas this latter had greater lactose and ash content. The analysis of mineral content revealed that calcium and magnesium levels were higher in skim colostrum powder while the iron level did not differ significantly between skim colostrum and milk powder. The measurements of colour characteristics indicated that dromedary skim colostrum powder was redder, but less yellow and white than dromedary skim milk powder. Further, dromedary skim milk powder had higher bulk density and tapped bulk density. Protein solubility of skim colostrum powder exceeded that of skim milk powder over a wide range of pH (3-8). The antioxidant activities were evaluated using various *in vitro* tests, including 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-azino-bis (3-ethylbenzthiazoline-6-sulphonic acid) (ABTS) radical scavenging activities, ferric reducing power assay and ferrous chelating activity. Both dromedary skim colostrum and milk powder exhibited antioxidant activities in a dose dependent manner. DPPH and ABTS radical scavenging activities were almost similar for skim colostrum and milk powder whereas ferric reducing power and ferrous chelating activity were more pronounced in dromedary skim colostrum powder whatever the concentration tested. Hence, freeze-drying process could be used as an effective tool for producing powder from dromedary skim colostrum and milk with nutritional and antioxidant properties.

Key words: lyophilization; nutritive value; protein solubility; scavenging activity; chelating power