

Zinc speciation in milk sample

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Milk is a complex fluid required for growth and development of newborn. It is constituted of water, proteins, lipids, carbohydrates, and micronutrients (vitamins, enzymes, and minerals). All of these substances have important nutritional values. Zinc is an essential trace element in human nutrition, mainly involved in the metabolism of nucleic acid and protein synthesis, and therefore crucial in the process of cell multiplication. Milk is responsible for about 25% of the total recommended daily intake of zinc. There are differences already described in the literature about the form of association between the Zn and protein in human and cow milk, such as the cow's milk form the complex Zn-casein-Ca-P. In human milk the predominant species is the Zn-citrate.

The aim of this work was the development sample preparations procedures to characterize the zinc-binding components of cow's milk, goat's milk and "soya" milk. Microwave sample digestion was used to sample preparation to milk samples graphite furnace atomic absorption spectrometry determination of total Zn and to assess the effect of processing on these components and on the pattern of zinc distribution in milk fractions (fat, casein, and whey), after separation by using polyacrylamide gel electrophoresis of casein sample (Urea-Page) (Fig. 1).

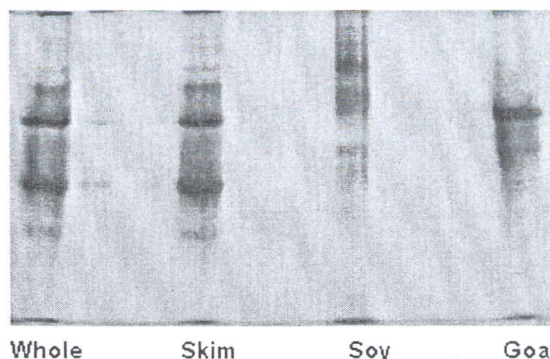


Figure 1: Electrophoresis of polyacrylamide gel (10%) of urea with samples of whole milk, skim milk, soy milk and goat's milk

The results will be discussed considering micro vials microwave digestion and Zn sample distribution and possible alterations in the zinc-binding pattern during processing in the different evaluated milk, mainly considering zinc bioavailability.