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VARIATION FACTORS OF SOME MINERALS IN CAMEL MILK

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Abstract: In four regions of Kazakhstan (Abyrau, Aralsk, Shymkent and Almaty), a survey on camel farms was achieved in order to study the variability of the physico-chemical composition of camel milk both in dromedary (*Camelus dromedarius*) and Bactrian (*Camelus bactrianus*) camel as well as their hybrids. As the whole, 163 milk samples were analyzed for calcium, phosphorus and iron determination. In order to maximize the variance, the samples were done in four different seasons which expressed the feeding change and the physiological stage changes as the calving season was concentrated in few months. The mean values were respectively 1.232 ± 0.292 g/l, 1.003 ± 0.217 g/l and 2.02 ± 1.24 mg/l for calcium, phosphorus and iron. No species, season or region effect was observed on iron content in the milk. Calcium and phosphorus change significantly according to season and species, but only phosphorus was linked to region effect. Especially phosphorus content is high in Aralsk region (1.156 ± 0.279 g/l). Globally, it is noticeable to observe the high level of phosphorus in the camel milk of Kazakhstan compared to the literature's results.

Keywords: Camel milk, minerals, lead, phosphorus, calcium, iron

1. Introduction

The consumption of camel milk, especially under fermented form (named *shubat*), is a very old tradition in Kazakhstan. Peoples give many beneficial properties to these milk products. It is traditionally used for tuberculosis treatment, in gastro-enteritis, any infectious and also like tonic drunk (Sharmanov and Dzhangabylov, 1991). These medical properties of camel milk and *shubat* could be attributed to some substances, like proteins, lipids and vitamins (Elagamy, 1992, 2000; Farah, 1993; Benkerroum et al., 2004; Konuspayeva et al., 2004). Yet, camel milk is well known also for its richness in minerals (Farah, 1993) interacting with the above substances. It could also contain undesirable metals in case of polluted environment. Indeed, the ecological conditions in Kazakhstan could have an important impact on the milk composition, especially its mineral content due to heavy metals in soil and plants intended for animal feeding.

The current camel population in Kazakhstan is around 145,000 heads (Anonymous, 2006). In the country, the genus *Camelus* included two species cohabiting in the same areas and even on the same farms: the one-humped camel (*Camelus dromedarius*) and the Bactrian two-humped camel (*Camelus bactrianus*), and their hybrids (Terenytev, 1975; Konuspayeva and Faye, 2004). This peculiarity fact allowed the comparison of milk composition of those animals reared in similar environments.

In the present study, four minerals were taken in account, i.e. the main minerals interacting with other components of milk (calcium, phosphorus and iron) and lead which is one of the more toxic heavy metal for human consumers.