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Physico-chemical characteristics of fresh and corresponding pasteurized camel milks from intensive dairy farm in Saudi Arabia.

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Compared with cow milk, the knowledge concerning the physico-chemical characteristics of camel milk is confuse and sometimes discordant. Explanations concerning these discordances are differences in the geographical origin of camel milk and analytical methods used for the characterization. The objective of this study was to describe precisely the physico-chemical characteristics of fresh whole and corresponding camel milk from the Camel and Range Research Center located at Al-Jouf, Sakaka (Saudi Arabia).The analyses were performed to (1) Determine the global composition of this milk (total and whey proteins, main minerals, lactose and fat); (2) Identity of the main proteins by mass spectrometry previously separated by reversed phase chromatography (3) Characterize the micellar properties of casein micelle in terms of mineralization, size, charge and hydration. The collected milk came from 16 milking camels. The recovered volume, corresponding to 2 milking, was 150 L. One liter of raw milk and one liter of the corresponding pasteurized milk (70°C for 10 min) was sampled for the physico-chemical characterization. Experiments were performed in duplicate. For raw milk, the concentrations of dry matter, fat, lactose, total nitrogen, noncasein nitrogen, Ca, inorganic phosphate, Mg, Na, K, Cl and citrate were 110, 25.5, 49, 29, 9.6, 1.23, 1.52, 0.09, 1.07, 1.71, 1.54 and 1.67 g/kg. The chromatographic profiles of the main proteins were complex but the different caseins molecules were identified. No b-lactoglobulin was detected. Different molecular masses were also determined without identify precisely the corresponding proteins. Concerning the micellar characteristics, the zeta potential was about −15.5 mV, the hydration 1.70 g of water per g of dry pellet of ultracentrifugation and the average size of about 250 nm. These micelles contained Ca and inorganic phosphate with 0.04 and 0.04 g of these ions/g of casein. The mass ratio of micellar Ca/Pi was close to 1.0. All these parameters were not significantly affected by the pasteurization.

Key Words: camel milk, pasteurization, casein micelle