

Title of Abstract:

Processing of Donor Human Milk: Impact on Macronutrients and Bioactive Components

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Abstract Description:

Three random human milk samples were obtained from three separate companies (two commercial sources and one non-profit donor milk bank), that utilize different processing methods (holder pasteurization (H), vat pasteurization (V), and retort sterilization (R)). Each human milk sample obtained were derived from different lots. The human milk samples were analyzed for macronutrient content using a Fourier transform mid-infrared spectroscopy milk analyzer. Additionally, the concentrations of IgA, IgM, IgG, lactoferrin, lysozyme, α -lactalbumin, α anti-trypsin, caseins and human milk oligosaccharides were analyzed by liquid chromatography-mass spectrometry. Results: Among the macronutrients, protein concentration was significantly higher (22%) in the H samples, compared with the V or R samples. In addition, there was significantly less fat (31%) and calorie concentration (16%) in the R compared with the V samples. The concentrations of IgM, lactoferrin, α -lactalbumin, α -anti-trypsin, abundance of α -casein, b-casein and k-casein were 23-130% significantly lower in the R compared with V and H samples. The total human milk oligosaccharide concentration was 62% lower in the R samples than the H and 21% lower when compared to V samples. Fucosylated, sialylated and non-fucosylated neutral HMOs were 16-116% lower in abundance in R compared with X samples. Conclusion: A random set of commercially available human milk samples that had undergone retort sterilization had lower macronutrient, bioactive human milk proteins, and human milk oligosaccharides compared with human milk that had undergone VAT and Holder pasteurization. Thus, rigorous testing of commercially available human milk for the quantity of nutrients and bioactive components are warranted to ensure that vulnerable premature infants are receiving the growth and protection they require.

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