

**A comparison of the heat stability of fresh milk protein concentrates obtained by
microfiltration, ultrafiltration and diafiltration**

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Short title: **Heat stability of concentrates obtained by filtration processes**

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Summary

The objective of this work was to evaluate the impact of changes during membrane filtration on the heat stability of milk protein concentrates. Dairy protein concentrates have been widely employed in high protein drinks formulations and their stability to heat treatment is critical to ensure quality of the final product. Pasteurized milk was 3x concentrated by membrane filtration, and the ionic composition was modified by addition of water or permeate from filtration (diafiltration). Diafiltration with water did not affect the apparent diameter of the casein micelles, but had a positive effect on heat coagulation time (HCT), which was significantly longer (50 min), compared to the non diafiltered concentrates (about 30 min). UHT treatments increased the particle size of the casein micelles, as well as the turbidity of retentates. A further analysis of the protein composition of the unsedimentable fraction confirmed the difference between diafiltration with permeate and with water, highlighting the importance of soluble protein composition on the processing functionality of milk concentrates.