

**Effects of preheat treatment and Ca<sup>2+</sup> concentration on the gelation properties of nanofiltered and evaporated milk protein concentrates**Yunna Wang<sup>1</sup>, Jialu Cao<sup>1</sup> and Yan Li<sup>2</sup><sup>1</sup>China Agricultural University, China<sup>2</sup>Beijing Technology and Business University, China

Milk protein concentrates (MPCs) are highly nutritional and functional products used as newly developed functional ingredients in food industries. The aim of present study is to compare the glucono- $\delta$ -lactone (GDL) induced gelation properties of nanofiltered MPC (NF- MPC) and evaporated MPC (EP- MPC) with different preheat treatments (85°C, 30 min; 92°C, 5 min) and Ca<sup>2+</sup> concentration (5-40 mmol L<sup>-1</sup>). The results showed that preheat treatment facilitated gelation. The gel properties, such as elastic modulus (G'), loss tangent (tan  $\delta$ ), and hardness of both NF- MPC and EP- MPC were increased and whey separation decreased. The gel structure had a fine-stranded network with more flexible strands compared with the same properties of unheated MPC. But it was difficult to see differences between the two preheat treatment conditions and two kinds of MPC gels. Effects of the Ca<sup>2+</sup> concentration on both MPC gels were complex. Hardness, G' value and whey separation degree decreased and the gel network structure became unclear, thicker strands and clusters of aggregated particles were formed with the increase of Ca<sup>2+</sup> concentration. No significant differences were observed between EP-MPC and NF-MPC in terms of gel network structure and tan  $\delta$ . However, EP- MPC showed higher hardness, G' value and lower whey separation degree with the same Ca<sup>2+</sup> supplements compared to those of NF-MPC. This result suggested that the application of NF-MPC in food gel properties is no worse than that of EP-MPC. In the case of calcium supplementation, EP-MPC is slightly better than NF-MPC.

**Biography**

Yunna Wang has her expertise in "Agricultural Products Processing" and "Dairy Science". In recent years, with "whipping cream" and its raw materials "milk protein concentrate" "anhydrous milk fat" as the basic research objects, she carries out a more systematic research work on the gel properties of milk protein concentrates, the crystallization behavior of milk fat, the whipping properties and the stability of whipping cream. She has already published "Review: Study on the preparation technology and influence factors of whipping cream", "Review: researches of the application development of whipping cream at home and abroad" (China 's core journals), "Stability and physical properties of recombined dairy cream: Effects of soybean lecithin", and also participated in academic conferences in related fields both at home and abroad.

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