

Effect of sodium polyphosphate on particle size of heat-induced whey protein concentrate aggregates

Diru Liu¹, Jianjun Cheng², Changhui Zhao¹, Mingruo Guo^{2, 3*}

¹ College of Food Science and Engineering, Jilin University, Changchun, 130062, PR China

² Department of Dairy Engineering, College of Food Science, Northeast Agricultural University, Harbin, 150030, PR China

³ The Department of Nutrition and Food Sciences, The University of Vermont, Burlington, VT 05405, USA

Short title: **Particle distribution of whey protein aggregates**

*Correspondence: Mingruo Guo
Department of Nutrition and Food Sciences
The University of Vermont
Burlington, VT 05405
USA
Phone: 8026568168
E-mail: mguo@uvm.edu

Summary

Heat-induced polymerization and phosphorylation have been known to improve the nutritional and functional properties of proteins. This study aimed to investigate the effect of sodium tripolyphosphate (STPP) on particle size distribution of polymerized whey protein concentrate aggregates (PPWPC) prepared with different treatments. The results showed that STPP level (>0.5%) or heating for longer time (>15 min) or at high pH values (8-8.5) facilitated formation of larger particles (>10 μm). The PPWPC in desirable particle size distribution was obtained by heating the whey protein concentrate (WPC) solution (8%) with appropriate STPP content (0.4%) at 85°C for 5 min. Results indicated that thermal treatment of WPC with STPP could produce aggregates that are suitable to be applied as a fat replacer for non-fat dairy products.