

22nd Euro-Global Summit on

Food and Beverages

February 28-March 01, 2019 | London, UK

Effect of the type of acid on the formation of soluble complexes of thermally denatured β -lactoglobulin and Carboxymethyl Cellulose

Farias Maria Edith¹, Masci Eliana¹, Loria Karina¹, Alfano Ezequiel¹, Martínez María Julia² and Perez Oscar E²¹National University of Lujan, Buenos Aires, Argentina²University of Buenos Aires, Argentina

The objective of this work was to study the effect of type of acid (hydrochloric, lactic, citric and acetic) on the formation of soluble complexes of thermally denatured β -lactoglobulin (β -lg) and Carboxymethyl Cellulose (CMC). β -lg was prepared at different concentrations (0.125, 0.250 and 0.500% w/w) at pH 7.0 and heated at 80°C for 15 minutes. The complexes were formed with 0.3% (w/w) of CMC and two percentages of protein (0.125 and 0.250) at pH 4. They were characterized by UV-visible (absorbance at 600 nm), fluorescence, Dynamic Light Scattering (DLS), flow rheology and FTIR. The complexes showed greater coefficient of consistency, K, and lower pseudoplastic index (n) than CMC pure. The 0.125 β -lg/0.3 CMC complexes formed with acetic or lactic acids had the highest K and the lowest n. The 0.250 β -lg/0.3 CMC complexes formed with acetic acid had the highest K and the lowest n. Interestingly, K decreased with the protein ratio increase for the β -lg/CMC complexes formed with HCl. The NaCl addition at 100 mM or more decreased the turbidity of all soluble complexes. However, the complexes 0.125 β -lg/0.3 CMC formed with acetic acid and the complexes 0.250 β -lg/0.3 CMC formed with acetic, lactic and citric acid showed stable curves in the fluorescence tests. The FTIR spectra of the complexes showed electrostatic interactions between the macromolecules. It is concluded that the complexes formed with acetic acid have high electrostatic interaction, even in presence of salt, for both concentrations of proteins studied. On the other hand, the complexes 0.250 β -lg/0.3 CMC formed with HCl revealed an excess of protein that lowered the viscosity of the systems. This study shows that the type of acid used in the formation of a soluble complex is as essential as the protein-polysaccharide ratio, the pH or the nature of the polymers. This knowledge will be used in the future for the replacement of fat in food systems like yogurt.

efarias@unlu.edu.ar

Notes: