Effects of Temperature and RH on Whey Protein Isolate and Commercial Citrus Pectin Conjugates: Application as an emulsifier in β-carotene O/W Emulsion

ABSTRACT

Dry heat treatment (DHT) was performed to obtain Whey Protein Isolate (WPI)-High Methoxy commercial Citrus Pectin (HMCCP) conjugates. The conjugates were expected to form through Maillard reaction. The formation of conjugates through Maillard reaction is influenced by different factors such as temperature (T) and Relative Humidity (RH). In this study, we evaluated the impact of T and RH on the functionality of WPI-CCP conjugates in stabilizing β-carotene loaded emulsion. The conjugates were formed through dry heat treatment at T of 60, 70, 80 ^{o}C and RH of 60, 70, and 80%. There was formation of high molecular weight compounds in the conjugates upon DHT at 80 ^{o}C and RH of 80% (C8080) as confirmed by SDS-PAGE analysis. Increasing the DHT temperature increased the Degree of glycation (DG) of the conjugates. C8080 stabilized emulsions showed to have the lowest viscosity. Regarding the stability of the beta carotene-loaded emulsions, beta carotene in the emulsions stabilized by the conjugates had better stability than that in those stabilized by native WPI and mixture of WPI-CCP. It showed that the presence of conjugates in the emulsions provides better stability to the beta carotene.

Keyword: Pectin; Whey Protein Isolate; Conjugates; Dry Heat Treatment; Emulsion, β-carotene