Inulin, a healthy dietary fiber, was selected for glycation with whey protein isolate (WPI) with the goal to improve heat stability of WPI without the formation of undesirable products. Conjugates were prepared by freeze drying the mixture solutions of WPI and inulin at different weight ratios followed by dry-heating at various temperatures, relative humidity levels and incubation times. Heat stability, the extent of the reaction and potential mechanism for improved heat stability were evaluated.

Results showed that optimum glycation can be achieved by dry-heating WPI-inulin mixture at 2:1, 4:1 and 6:1 weight ratios at 80°C for 12 to 72 h without controlling the relative humidity. Improved heat stability of conjugates was shown by a decrease in turbidity and particle size after heating 6% w/w protein at pH 6.0 without significant change in flow behaviors or significant loss of essential amino acids. Improved heat stability may be due to an increase in negative charge as well as increased stabilization of the protein.

With limited degree of glycation, low viscosity and improved heat stability, WPI-inulin conjugates has a great potential to be utilized as food ingredients, especially in beverage industry.