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Factors affecting thermal stability of whey protein

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ABSTRACT : Whey is the largest by-product of the dairy industry both in terms of volume and milk solids. Whey proteins have excellent nutritional, therapeutical and functional properties. Therefore, whey protein utilization into beverage is one of the most attractive avenues for human consumption. But steps involved in industrial production of Whey Protein Concentrate (WPC) and whey beverage make them susceptible to thermal denaturation. Hence, protein fortified fruit beverage suffer from sedimentation and off flavor during storage. The present investigation was undertaken to study the effect of different factors like concentration of protein, pH, time-temperature combination and use of different acidulants on solubility and sedimentation of whey proteins. Effect of pH studied for the wide range, i.e., 2.25 to 8.0. At all thermal treatments 85, 90 and 95°C whey proteins have shown low solubility near to their isoelectric point. Whey proteins exhibited better thermal stability under acidic pH (3.0-3.4) for all concentrations (1-3%). Solubility and sedimentation of WPC was found better between the range of pH 3.1 to 3.4 and at 95 °C. Use of different acidulants like phosphoric acid, citric acid and fumaric acid also affects solubility and sedimentation; in which fumaric acid gives better solubility and less sedimentation.

Key Words: Paneer whey, whey proteins, solubility, sedimentation, thermal stability.