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Nutritional Potential and Functionality of Whey Powder Influenced by Different Processing Temperature and Storage

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Abstract : Whey is an excellent food ingredient owing to its high nutritive value and its functional properties. However, composition of whey varies depending on composition of milk, processing conditions, processing method, and its whey protein content. The aim of this study was to prepare a whey powder from raw whey and to determine the influence of different processing temperatures (160 and 180 °C) on the physicochemical, functional properties during storage of 180 days and on whey protein denaturation. Results have shown that temperature significantly (P < 0.05) affects the pH, acidity, non-protein nitrogen (NPN), protein total soluble solids, fat and lactose contents. Significantly (p < 0.05) higher foaming capacity (FC), foam stability (FS), whey protein nitrogen index (WPNI), and a lower turbidity and solubility index (SI) were observed in whey powder processed at 160 °C compared to whey powder processed at 180 °C. During storage of 180 days, slow but progressive changes were noticed on the physicochemical and functional properties of whey powder. Reverse phase-HPLC analysis revealed a significant (P < 0.05) effect of temperature on whey protein contents. Denaturation of β-Lactoglobulin is followed by α-lacalbumin, casein glycomacropeptide (CMP/GMP), and bovine serum albumin (BSA).

Keywords : whey powder, temperature, denaturation, reverse phase, HPLC
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