

Effect of adding NaCl or KCl during manufacture of MPC80 on its physico-chemical properties.

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Milk protein concentrate (MPC) powder with equal to or greater than 80% protein concentration has been shown to have poor solubility. The poor solubility of MPC limits its potential usage in the food industry. In a previous study in our lab, we have shown that the addition of 50–150mM NaCl into diafiltration water can improve the solubility of MPC80. However, adding NaCl into diafiltration water may impact other functional properties. The objective of this study was to determine the impact of addition of 150mM KCl and NaCl during MPC manufacture on solubility and other functional properties (foaming stability, turbidity and heat stability) on the resulting MPC powders. The powder samples were reconstituted at room temperature to contain 5% total solids. Percent solubility was tested after 3 h of mixing and was calculated as total solids in the supernatant to total solids in the original solution. Percent foaming stability, expressed as collapse of foam, was tested after 5 min to initial mass of foam. Turbidity was measured in Nephelos Turbidity Units (NTU) using a calibrated nephelometer. Heat stability was determined by measuring the heat coagulation time of 2 mL samples immersed in a oil bath set at 140°C. Our results indicate that higher solubility ($P < 0.001$) was found in NaCl (100%) and KCl-treated MPC80 (98.8%) than in control MPC80 (90%). Foaming stability ($P < 0.001$) was found to be highest in KCl-treated MPC (21.8%) followed by NaCl-treated MPC (10.6%) and then followed by control MPC (4.6%). Higher heat stability ($P < 0.001$) was observed in control MPC80 (23.7 min) when compared with NaCl (16.5 min) and KCl-treated MPC80 (16.4 min). Lower turbidity ($P < 0.001$) was observed in NaCl (129 NTU) and KCl-treated MPC (117 NTU) as compared with control MPC (564.2 NTU). Our results indicate that the functional properties of MPC80 powders are influenced by addition of KCl or NaCl in the manufacture of MPC. These results suggest that the functional properties of MPC80 powders can be modified by changing its mineral composition during its manufacture.

Key words: MPC80, functional properties