

Effects of Spray Dryer Atomizer Speed on Casein Micelle Size in Whole Fat Milk Powder and Physicochemical Properties of White Cheese

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Abstract : An industrial spray dryer was used, and the effects of atomizer speed on the physicochemical properties of milk powder, the textural and sensory characteristics of white cheese made from this milk powder, were evaluated. For this purpose, whole milk was converted into powder by using three different speeds (10,000, 11,000, and 12,000 rpm). Results showed that with increasing atomizer speed in the spray dryer, the average size of casein micelle is significantly decreased ($p < 0.05$), whereas no significant effect is observed on the chemical properties of milk powder. White cheese characteristics indicated that with increasing atomizer speed, texture parameters, such as hardness, mastication, and gumminess, were significantly reduced ($p < 0.05$). Sensory evaluation also revealed that cheese samples prepared with dried milk produced at 12,000 rpm were highly accepted by panelists. Overall, the findings suggested that 12,000 rpm is the optimal atomizer speed for milk powder production.

Keywords : spray drying, powder technology, atomizer speed, particle size, white cheese physical properties

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