

ABSTRACT

Stickiness is an important problem in spray drying high sugar materials like sweet soy sauce due to low glass transition temperature. The use of carrier agents, maltodextrin (MD) and whey protein isolate (WPI), and control of inlet temperature during spray drying could improve the issue by facilitating proper drying and forming film on powder surfaces. The objective is to evaluate the effect of WPI and MD as carrier agent and inlet temperature on the physical properties of sweet soy sauce powder. In this study, the powder was produced using spray drying with varied inlet temperatures (150°C and 200°C) and composition of carrier agents (WPI:MD = 0:8, 1:7, and 3:5). The resulting powder was analyzed for the yield, moisture content, water activity, hygroscopicity, bulk and tapped density, Carr's index and Hausner ratio, dissolution rate, solubility, and color. Analysis of variance and t-test were employed to evaluate the effect of carrier composition and inlet temperature towards the powder characteristics, respectively. The result shows that inlet temperature highly influenced the dissolution rate, whereas moisture content, water activity, hygroscopicity, density, dissolution rate, solubility, and color (a^* and b^*) of powder were affected by the ratio of carriers. Sweet soy sauce powder produced with 0.8% WPI ratio and inlet temperature of 200°C showed better powder quality among all powder. It has moderate yield (33.33%), bulk and tapped density (0.41 and 0.48 g/ml), and hygroscopicity (22.87%), good flowability (CI of 13.33 and HR of 1.16), high solubility (91.96%), low moisture content (1.47%) and water activity (0.15).

Keywords: sweet soy sauce, spray drying, whey protein isolate, maltodextrin, powder, physical characteristics, inlet temperature.