Effects of propylene glycol alginate and sucrose esters on the physicochemical properties of modified starch-stabilized beverage emulsions

ABSTRACT

This study was conducted to investigate the effect of main emulsion components namely, modified starch, propylene glycol alginate (PGA), sucrose laurate and sucrose stearate on creaming index, cloudiness, average droplet size and conductivity of soursop beverage emulsions. Generally, the use of different emulsifiers or a mixture of emulsifiers has a significant ($p < 0.05$) effect on the response variables studied. The addition of PGA had a significant ($p < 0.05$) effect on the creaming index at 55 °C, while PGA-stabilized (PGA1) emulsions showed low creaming stability at both 25 °C and 55 °C. Conversely, the utilization of PGA either as a mixture or sole emulsifier, showed significantly ($p < 0.05$) higher cloudiness, as larger average droplet size will affect the refractive index of the oil and aqueous phases. Additionally, the cloudiness was directly proportional to the mean droplet size of the dispersed phase. The inclusion of PGA into the formulation could have disrupted the properties of the interfacial film, thus resulting in larger droplet size. While unadsorbed ionized PGA could have contributed to higher conductivity of emulsions prepared at low pH. Generally, emulsions prepared using sucrose monoesters or as a mixture with modified starch emulsions have significantly ($p < 0.05$) lower creaming index and conductivity values, but higher cloudiness and average droplet size.

Keyword: Soursop beverage emulsion; Propylene glycol alginate; Sucrose esters; Emulsion components; Physicochemical properties