

Physicochemical properties of beverage emulsion as function of glycerol and vegetable oil contents.

ABSTRACT

The main objective of present study was to investigate the effect of type and concentration of two emulsion components, namely glycerol (0.5, 1 and 1.5% w/w) and vegetable oil (2, 3 and 4% w/w), on average droplet size, polydispersity index, electrophoretic mobility, pH, cloudiness, density and stability of beverage emulsion. The results indicated that the physicochemical properties of beverage emulsions were significantly ($p < 0.05$) influenced by the addition of different concentration levels of supplementary emulsion components. The magnitude of all physicochemical properties significantly ($p < 0.05$) increased with increasing the concentration of glycerol from 0.5 to 1.5% (w/w). On the other hand, the increase in vegetable oil content resulted in significant ($p < 0.05$) increase in polydispersity index, cloudiness and stability of beverage emulsion; while a significant ($p < 0.05$) reduction in average droplet size and density was observed with increasing the proportion of vegetable oil in basic emulsion formulation. The addition of glycerol resulted in significant ($p < 0.05$) increase in average droplet size as compared to the control sample and vegetable oil-contained beverage emulsions. The present observation could be due to the positive effect of glycerol on the viscosity of beverage emulsion, thereby reducing the efficiency of homogenization and emulsification processes. The addition of both supplementary components led to undesirable effect on the homogeneity (i.e. higher PDI) of beverage emulsions. Electrophoretic mobility significantly ($p < 0.05$) increased as the concentration of glycerol or vegetable oil was increased. The significant ($p < 0.05$) effect of glycerol or vegetable oil on electrophoretic mobility was found to be pH dependent. The results showed that pH value was significantly increased with increasing glycerol or vegetable oil content, thus increasing the degree of electrophoretic mobility.

Keyword: Glycerol; Vegetable oil; Emulsion component; Average droplet size; Polydispersity index; Electrophoretic mobility; Cloudiness.