

migration, prevent oil separation, provide suspension, increase viscosity, and prevent ice crystal formation, whereas emulsifiers reduce surface tensions and interfacial tensions and stabilize oil in water emulsions through the steric and mechanical stabilization mechanisms [35, 36].

There have been several studies on using alginate as an emulsifier and stabilizer. Beneficiary lipids that are highly unstable are converted to nanoemulsions for better stability and release. In order to obtain such nanoemulsions, they have to be made stable. Alginates have been used as a stabilizer for such nanoemulsions and have been found that stable emulsions were formed at alkaline pH, temperature 50 °C at an electrolyte concentration of 100 mM [37]. Alginates were also found to enhance the stability of dietary protein emulsions [38]. Further study on alginates extracted from six types of alginofit called *S. crassifolium*, *S. polycystum*, *Padina*, *S. echinocarpum*, *S. duplicatum*, and *S. binderi* in cake making showed that good quality of cake has been obtained from 0.75% alginate from *S. duplicatum*. They were also found to have fat and protein content of 18.98% and 63.11%, respectively [39]. Sodium alginate was found to increase stabilization of ice cream than other stabilizers and also found to have better whipping of the mix when combining sodium alginate with calcium caseinate. The increased whipping was found due to the formation of sodium caseinate and calcium alginate [40]. In soursop beverage emulsions, PGA, either as sole compound or as mixtures at $p < 0.005$, was found to increase higher cloudiness, larger droplet size, and also low creaming stability [41]. In addition to this, alginates were also found to stabilize the wheat dough during proofing and also retard crumb firming [42].

13.3.3 Texturizers

Texturizers are compounds that protect the food component by increasing its texture. Alginates exclusively as texturizers have been extensively studied, and they have been used as a texturizer in food industry [43]. In a study by Nicomrat *et al.*, [44], alginate has been used as a texturizer in moo yor batter. Sodium alginate was found to affect the rheological properties; decrease cooking loss and moisture content; increase hardness, chewiness, springiness, gumminess, and cohesiveness; and improve product texture. They were found to be more suitable as texturizers in moo yor batter than other agents.

13.3.4 Encapsulation

Encapsulation is the process to entrap one substance to another and the substance that is entrapped can be of solid, liquid, or gas. Encapsulation produces