A comparative study of the physicochemical properties of a virgin coconut oil emulsion and commercial food supplement emulsions

ABSTRACT

Food manufacturers are interested in developing emulsion-based products into nutritional foods by using beneficial oils, such as fish oil and virgin coconut oil (VCO). In this study, the physicochemical properties of a VCO oil-in-water emulsion was investigated and compared to other commercial oil-in-water emulsion products (C1, C2, C3, and C4). C3 exhibited the smallest droplet size of 3.25 µm. The pH for the emulsion samples ranged from 2.52 to 4.38 and thus were categorised as acidic. In a texture analysis, C2 was described as the most firm, very adhesive and cohesive, as well as having high compressibility properties. From a rheological viewpoint, all the emulsion samples exhibited non-Newtonian behaviour, which manifested as a shear-thinning property. The G'G" crossover illustrated by the VCO emulsion in the amplitude sweep graph but not the other commercial samples illustrated that the VCO emulsion had a better mouthfeel. In this context, the VCO emulsion yielded the highest zeta potential (64.86 mV), which was attributed to its strong repulsive forces, leading to a good dispersion system. C2 comprised the highest percentage of fat among all emulsion samples, followed by the VCO emulsion, with 18.44% and 6.59%, respectively.

Keyword: Virgin coconut oil; Emulsion; Physicochemical properties; Rheological properties; Arabic gum; Xanthan gum