Application of chickpea and sesame protein concentrate treated by transglutaminase in the formulation of a reduced-fat mayonnaise based on sesame oleosome

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Demand for low or reduced fat products has been increasing rapidly during the last two decades. Furthermore, sesame oil has been proved as a cholesterol lowering oil with several health benefits. In this research, oleosome of sesame seeds were produced after step-by-step milling and centrifugation process and the oleosome was characterised in terms of rheology and microstructure. Then the oleosome was used in the formulation of a reduced-fat mayonnaise with the final fat content of 45 %. Chickpea and sesame protein concentrates and their 1:1 mixture, post-treated by transglutaminase, were used as stabilizing agents. The fabricated reduced-fat product exhibited acceptable heat and physical stability in comparison with the standard samples. However, the stability was higher in samples containing sesame protein. This could be due to the smaller droplet sizes found by DLS measurements. Microscopic analysis also confirmed this observation and revealed that in samples containing chickpea protein aggregation of smaller particles could be detected. Rheometric analysis indicated that higher loss and storage modulus were obtained by the addition of sesame protein in comparison with chickpea protein, while zeta potential was lower for sesame protein containing samples. The results of this study indicated that a healthy reduced fat maionnase can be formulated by the application of sesame seed oleosomes and the product can be stabilised by the aid of sesame and chickpea protein.