

Applications of Multiple Emulsions in Functional Food Production

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Foods besides having nutrients, have been satisfactorily shown to improve the state of health and wellbeing and/or to reduce the risk of disease, are denominated functional foods. Among the technological strategies used to design and develop functional foods, the modification of the food formulation process also makes it possible to use traditional ingredients, and other ingredients specifically designed with certain attributes (nature or composition) that confer healthy properties. The use of multiple (double) emulsions is one of these methods. Multiple emulsions are emulsion within emulsions and divided into two major types; water-in-oil-in-water (w/o/w) and oil-in-water-in-oil (o/w/o). There are two main reasons for considering w/o/w emulsions for healthier food applications; to improve fat content and to encapsulate (protect) bioactive compounds. In foods using oil-in-water emulsions, a w/o/w emulsion can be used to reduce the fat content, since part of the lipid material is replaced by water particles dispersed inside it. Numerous advantages of encapsulation of hydrophilic bioactive compounds by means of w/o/w emulsions have been reported. Most of the studies related to multiple emulsions preparation are not suitable for use in food applications because; they are not easily scaled up, they are not cost effective or they may require the use of non-food grade ingredients, unsuitable for human consumption.

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