
BIGELS PRODUCED WITH WHEY PROTEIN ISOLATE AND GLYCEROL MONOSTEARATE THROUGH HOT AND COLD GELIFICATION

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Bigels are semisolid systems composed by a mixture of hydrogel and oleogel. They can be used as texture modifiers and act as vehicles for compounds with different polarities. However, only recently, bigels have been studied for food applications, where the criteria for their production must consider that the ingredients are GRAS. Thus, the aim of this work was developing a bigel with sunflower oil, glyceryl monostearate (GM) and whey protein isolate (WPI) gelled by hot and cold-set process (with NaCl 5 M addition). The oleogel was produced with GM (7,5% (p/v)) and the hydrogel with WPI (10 % (p/v)). Bigels were produced in the ratios 90:10 to 10:90 (hydrogel:oleogel). The mechanical properties and microstructure (optic microscopy and FTIR analysis) were evaluated. Results showed that the gelation process exerts influence on mechanical properties. Hot-set bigels produced squeezing gels with lower elasticity modulus (EM), while the cold-set ones were stronger, presenting a rupture point and higher values of EM. Such result is a consequence of the type of network that is formed during gelation process, since cold-set allows the formation of a more homogeneous gel. Moreover, hydrogel:oleogel ratio was also an important parameter. Increasing oleogel fraction decreases the EM, however, after 50 % of oleogel, the networks restructure and the gel became stronger. At lower oleogel fraction, the dispersed oleogel particles acted as an active filler that impairs the strength of the gel network, which also can be attributed to the lubricating effect of the oleogel. After 50 % bigel became water-in-oil system and increasing hydrogel particles fraction reinforces the gel properties. However, FTIR results show that the role of the fillers (hydrogel and oleogel) was purely physical, without any chemical interaction. Thus, results showed that it is possible to produce self-sustainable bigels using WPI gelled by different processes. Moreover, the mechanical properties can be modulated according to the bigel composition, allowing its application in different products of the food, pharmaceutical and cosmetic industries.