

Avocado and Flaxseed Oleogels: the prospect of a healthy saturated fat substitute

Oleogelation is a novel technique that represents the forming of liquid oils into a gel-like structure by entrapping the liquid phase into a thermo-reversible and three-dimensional gel network. There has been a great interest in Oleogelation in many areas like pharmaceuticals, food, and cosmetics. Oleogels are used to reduce the saturated and trans fatty acids in foods, making them healthier. The consumption of saturated and trans fatty acids increases the risk of cardiovascular diseases (Pehlivanoglu, Demirci, Toker, 2017). Avocado oil is high in oleic monounsaturated fatty acids and substantial amounts of health beneficial phytochemicals, such as vitamins and phytosterols. Avocado oil is rich in omega fatty acids that are good for human health, especially in preventing cardiovascular diseases (Wang et al., 2018). Safflower oil (SFO) from the seeds of *Carthamus tinctorius L* (Yenice variety) is colorless and flavorless and rich in linoleic acid (about 76% of total fat, a polyunsaturated FA) (He M, Armentano LE. 2011). Waxes are the most efficient oleogelators because of their ability to start crystallization at lower concentrations, easy to find, and they are natural. According to the FDA, waxes have been proven to be a good oleogelator, are natural, and have been recognized to have GRAS (generally recognized as safe) status (FDA,2018). Many types of oils and waxes can be used. For a successful oleogel, it is essential to find the right oil binding capacity (Patel et al., 2014). Three types of waxes were utilized; rice bran wax (4 and 8%), and carnauba, and candelilla wax (3 and 6%). The wax can affect the taste and texture of the food. It is essential to find the right ratio of wax to oil because a higher amount of wax will result in a strong and brittle gel. Otherwise, a small amount of wax will not create a stable gel. The objective of this study was to find the minimum amount of waxes to add in avocado oil and flaxseed oil to produce a stable oleogels useful for the food industry. The stability of the oleogel was analyzed with Oil Binding Capacity (OBC) Method and the visualization method at two different conditions (room temperature and 35 °C) during two different times (Day 1 and Day 7). The fatty acid composition of the oils was evaluated by gas chromatography (Florence et al., 2012). Candelilla wax has the most significant oil binding capacity, and it is also the most stable, even at higher temperatures. Carnauba wax is slightly stable but only with 8% wax. Rice bran wax was not stable at all with 3% wax at room and oven temperature. It had the lowest oil binding capacity out of all three waxes. Higher amounts of wax improve the oil binding capacity.