



Edible vegetal oils enriched with lycopene

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Lycopene is one of the most potent antioxidants and it is assumed to be one of the active compounds responsible for the health benefits attributed to tomato. There are scientific evidences that tomato products consumption, due to the lycopene activity, have significant association with the reduced risk of prostate cancer, gastric cancer and cardiovascular diseases. These results have potential public health implications and support the development of products that increase the consumption of lycopene as a strategy to reduce the risk of chronic diseases. Since lycopene is highly hydrophobic, it is easily dissolved in oil. It is apparent that the presence of fat in the intestine will promote the formation of micelle; therefore, including fat in the diet has the potential to improve the absorption of lycopene and other carotenoids. Dietary fatty acids may influence the absorption of lycopene, increasing plasma levels and the antioxidant activity of lycopene.

Thus, adding carotenoids to oil ensures the concomitant intake of lipid and carotenoids. The objective of this work was to enrich edible vegetable oils with lycopene. The advantage of the proposed enrichment technology is that carotenoids were obtained from natural sources and the extraction process did not require the use of solvents, since the vegetable oil itself was used as extraction vehicle. Mature tomato fruits (*Solanum lycopersicum* L.), Italian cultivar, were used as a source of lycopene. Soybean oil and olive oil were used as vehicles for tomato carotenoids extraction. The technique of extraction of carotenoids in vegetable oils developed by Embrapa Food Technology was applied. Identification and quantification of carotenoids were performed by HPLC, using a 33°C column oven, photodiode array detector, and a C30 YMC® S-3Carotenoid Column (4.6 x 250 mm; 3 µm). Carotenoids separation was obtained by a gradient elution of methanol and methyl *tert*-butyl ether, using a 0.8 mL/min flow rate, injection volume of 15 µL and run time of 28 min. The results showed a high content of lycopene in soybean oil (31.30 µg/g of lycopene) and in olive oil (31.42 µg/g of lycopene). The extraction yield of tomato lycopene using vegetable oils was 24% for soybean oil and olive oil. Considering the lycopene content of some food sources, such as *in natura* tomato (35 µg/g), it can be verified that the enriched oils presented a high content of this carotenoid. In addition to the lycopene content, the higher bioavailability of carotenoids in oil should be considered. The process of extraction of lycopene from tomatoes in vegetable oils proved to be efficient and represents an alternative source for daily lycopene ingestion. Enriched oils can be used as an ingredient (soybean oil and olive oil) or ready to eat (olive oil), promoting the ingestion of lycopene. An important observation regarding the sensorial characteristics of the enriched oils is that only the color changed in relation to the non-enriched oil, once the oil acquired the typical coloration of the carotenoid.

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