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DETERMINATION OF FATTY ACIDS PROFILE OF SUNFLOWER OIL SAMPLES BY NMR ^{1}H SPECTROSCOPY

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Abstract: Sunflower oil with a high content of oleic acid (Omega-9) and a sufficiently low content of polyunsaturated linoleic acid (Omega-6) is characterized by a lower nutritional value but greater chemical stability at high temperatures and in the presence of oxidizing agents, therefore, it has several advantages for the food and chemical industries, and also as a raw material for the production of biofuels. Therefore, chemical and physical properties of sunflower oil as well as its area of application depend on its fatty acids profile. The determination of the TAG composition of oil is a very important task, because due to selection there are a large number of sunflower varieties. The spectra of oil samples extracted from seeds of various sunflower varieties were investigated by NMR ¹H spectroscopy to determine fatty acids composition. This method based on estimation and comparison the proton integral intensities of allylic and bis-allylic CH₂ groups with intensity of glycerol protons that allows determining the amounts of each of these unsaturated fatty acids. It was shown each oil sample obtained has its individual TAG profile determining its physicochemical properties and nutritional value. Method ¹H-NMR spectroscopy compared with alternative analytical methods is rapid and non-destructive, so it is perspective to be used for determination of fatty acid composition of sunflower oil.

Keywords: sunflower oil, fatty acid, oleic acid, linoleic acid, NMR spectroscopy, fatty acids profile.

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