

PROCEEDINGS OF THE

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Novi Sad, Serbia
June 20-23, 2022

Proceedings of the

20th International Sunflower Conference



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Proceedings of the 20th International Sunflower Conference
Novi sad, Serbia, June 20-23, 2022

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The proceedings of the 20th International Sunflower Conference contain 153 contributions from scientists of 30 countries. They include plenary lectures, oral talks and regular communications presented with posters, among which, selected contributions were emphasized with short oral talks. The manuscripts are classified by research areas in ten separate sections. They offer a thorough review of the current state of the art of sunflower research and production around the world. The Organizing Committee is grateful to Tanja Vunjak and Aleksandar Vojisavljević for their excellent editorial assistance in the preparation of these Proceedings.

ISC2022 Organizing committee

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A NOVEL METHOD OF DETERMINATION OF INDIVIDUAL OIL CONTENT IN SUNFLOWER AND FLAXSEED OIL BLENDS

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Abstract

Vegetable oils have different sensory, physico-chemical and nutritive characteristics and shelf life, which is why the use of only one vegetable oil in diet is often not sufficient. Oil blending represents a very simple way to employ various characteristic properties of a large number of vegetable oils and is also an economical way to change sensory, physico-chemical and nutritive characteristics and improve oxidative stability. Blending of various vegetable oils can change the fatty acid compositions and provide a higher content and different composition of natural antioxidants and bioactive lipids, thereby improving the nutritive value and stability, i.e. shelf life of the obtained oil. Sunflower oil is one of the top five edible oils in the world, having a full priority in Serbia, due to the high availability of raw materials over others. Due to the presence of essential linoleic (omega 6) fatty acid and alpha-tocopherol (vitamin E), it has a high nutritive value, while due to its extremely good nutritive characteristics and the presence of bioactive components, such as essential alpha-linolenic (omega 3) fatty acid, flaxseed oil has been increasingly used in the diet in recent years. The aim of this paper is to determine the possibility of applying a gas chromatography device with a mass spectrometric detector (GC-MS) coupled to a newly developed mathematical model to determine the proportion of individual oils in blended oils. Nine blended oils with different proportions (0-100% w/w) of refined sunflower oil and cold pressed flaxseed oil, as well as pure refined sunflower oil and cold pressed flaxseed oil, were prepared and analyzed by GC-MS. The peaks of the molecular ions of specific fatty acids were integrated. Based on the surface areas of these peaks, a novel mathematical model was developed to determine the proportion of individual oils in the blends. All obtained experimental values are consistent with the actual mass fractions of individual oils in the oil blends. Very high correlation coefficient of 0.9964 between experimentally determined and actual proportions of individual oils in blends is an indicator of the applicability of the developed method presented in this work.

Keywords: Sunflower oil: Flaxseed oil: Blended oils: GC-MS: Mathematical model

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