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BOOK OF ABSTRACTS



9TH International Balkan
Conference in Sport Sciences



8TH International Scientific
Conference on Applied Sciences



7TH International Scientific
Conference of the Faculty of
Medical Sciences



6TH International Conference of
Natural Sciences and Mathematics



4TH International Conference of
Food Technology and Nutrition



2ND International Conference on
Sustainable Agriculture Farming
Systems

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MICROWAVE HEATING EFFECT ON THE OXIDATION AND QUALITY OF COLD PRESS SUNFLOWER OIL

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Abstract

Sunflower oil is widely used in the human diet, primarily due to its constituent components and its applications in producing functional products. Consequently, it becomes crucial to monitor the oil's quality by assessing defining parameters. The use of microwave ovens in food preparation has become widespread in recent years due to certain advantages that include saving time, energy and convenience. As a result of heat treatment of oils, various chemical reactions can occur, leading to the formation of products that may indicate deterioration or a reduction in quality. For this purpose, untreated oil (not subjected to heating) and oil heated in a microwave oven for varying durations (ranging from 4 to 20 minutes) were analyzed in this study. The quality assessment of cold-pressed sunflower oil was conducted using standard official methods to measure peroxide, acid, and iodine values. The progression of oil oxidation was tracked by analyzing conjugated dienes and conjugated trienes through UV-spectroscopy (method AOCS Ch 5-91).

Additionally, considering the theoretical link between microwave heating and changes in fatty acid composition, the fatty acid profile of the oil was determined following the guidelines outlined in MKC EN ISO 12966-4:2015. The results indicate a notable shift in the

peroxide value (Pbr). Specifically, after heating the oil for 4 minutes, the Pbr value exceeds the permitted limits. Furthermore, a decrease in the iodine value is observed with increasing heating time, while no significant changes are noted in the acid value. Additionally, changes in the content of unsaturated and saturated fatty acids are observed in cold-pressed sunflower oil. At specific wavelengths (232 and 268 nm), conjugated dienes and trienes were detected as oxidation products, i.e. the extinction coefficients (K232) and (K268) fell within the ranges of 3.72-4.16 and 1.25-2.56, respectively. These findings lead to the conclusion that microwave heating induces changes in the quality of cold-pressed sunflower oil. To maintain its quality, an appropriate choice of heat treatment is required.

Keywords: food quality, cold press sunflower oil, microwave heating, products of oxidation.