EFFECT OF SESAME SEEDS VARIETY ON CHEMICAL AND TECHNOLOGICAL CHARACTERISTICS OF SOME SESAME FOOD PRODUCTS

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ABSTRACT

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Three different types of sesame seeds were investigated, differ in origin (Egypt and Sudan) as well in shape and colour (white and red). Physical parameters and chemical composition, as well as oxidation stability and fatty acids profile for different varieties of sesame seeds were investigated. It was found that Sudanese red sesame seeds (SRS) revealed a significant variance compared to Egyptian and Sudanese white sesame seeds.

There was no significant difference in the moisture content of the three studied varieties. Egyptian white sesame seeds (EWS) show significantly higher oil content than Sudanese white sesame seeds (SWS) and Sudanese red sesame seeds (SRS) (56.68% against 49.73% and 48.83%, respectively). The protein content of SWS was lower than that of EWS and SRS. EWS contained lower amount of crude fiber.

The peroxide values obtained for the three sesame varieties are very low, i.e. less than 0.5 meq/Kg oil. Sudanese red sesame oil (SRSO) had a relatively low content in the free fatty acids (oleic acid %) compared to Egyptian white sesame oil (EWSO) and Sudanese red sesame oils (SRSO). The EWSO shows a remarkable stability to oxidation compared to SWSO and SRSO. The highest Rancimat was found in sesame oil extracted from EWS compared to SWS and SRS oils.

Oils of the three studied sesame seeds were analyzed to determine their fatty acid composition. The most abundant fatty acids were linoleic, oleic and palmitic acids, which together comprised about 88% in SWSO and up to 97% of the total fatty acids in EWSO and SRSO. Oleic and linoleic acids are the major fatty acids of sesame oils and they are found to be present in large amounts in the oils of the three studied sesame seeds, constituting more than 70% of the total.

Palmitic acid was the major saturated fatty acid of sesame oil comprising a ratio ranged between 15.85 to 18.47%. A high level of palmitic acid was found in Sudanese white sesame oil.

Sesame paste was produced from the three types of seeds. In conclusion, tehina samples were a good source of oil and protein. However, crude oil and crude fiber of sesame paste from EWS were high, but crude protein was lower in sesame paste produced from SWS and SRS.

Flow behaviour of sesame paste was investigated under different temperature ranged from 30 to 60˚C. At these temperatures sesame paste exhibited non-Newtonian behavior. There was a significant difference between the emulsion stability of the Sudanese red sesame paste (SRSP) and that of the Egyptian white sesame paste (EWSP) and Sudanese white sesame paste (SWSP). The emulsion stability was higher in sesame paste produced from SRS.

The headspace volatiles of the three samples were isolated and subjected to Gas chromatography-Mass spectrometry (GC-MS) analysis. A total of 38 volatile compounds were positively identified. The pyrazines, that having nutty aroma, were the predominant volatiles in all investigated samples, however sample SWS comprised the highest content of these compounds. Aldehydes were the second major volatiles in all samples.

Sensory evaluation showed insignificant ($P>0.05$) differences between all examined tehina samples for all tested varieties. Sample SWS exhibited the highest score of flavour quality compared to other samples. This may be due to the high content of pyrazines in the volatiles of this sample.

Contents

LIST OF TABLES

List of Figures